

**STATE OF OREGON  
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
Suite 965, 800 NE Oregon St., #28  
Portland, Oregon 97232**

**OPEN-FILE REPORT O-95-3**

**GEOHERMAL GRADIENTS IN OREGON, 1985-1994**

Prepared by  
David D. Blackwell  
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*Wells are also in Blue Binder . . . - See oversized area*

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Oregon Department of Geology and Mineral Industries



OSTI-58

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# GEOTHERMAL GRADIENTS IN OREGON, 1994

Compiled by

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Department of Geology  
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This data set is comprised of three groups of temperature-depth data. All the sites are located in southeastern Oregon. The first is a set of 7 wells logged during 1993 in south central Oregon in the Basin and Range province. All these wells, with the exception of the Blue Mountain Oil well, are water wells. These wells were part of a geothermal reconnaissance of this area. The Blue Mountain oil well of this set has been described by Sass et al. (1971) as well.

The second set of data consists of a group of wells that were logged by Marshall Gannett in the vicinity of the Vale, Oregon (Bowen and Blackwell, 1972; Blackwell et al., 1978) geothermal system in Malheur County. These wells were logged in 1986 during a study of the area described by Gannett (1988). There are 17 wells (plus one relog) in this data set. All these wells are in a small area just east of the town of Vale in Malheur County.

The third set of data represents the results of an exploration project in the general area of the Lake Owyhee thermal area in Malheur County. This data set is comprised of 16 wells. This data set was collected by Hunt Energy Corporation and made available through the efforts of Roger Bowers.

A small scale map of the locations of the wells is shown in Figure 1. The well location and some pertinent information about the wells is shown in Table 1. The detailed lists of temperature-depth data and plots for each well, either individually or with a group, follow the list of references cited.

## REFERENCES CITED

- Blackwell, D. D., D. A. Hull, R. G. Bowen, and J. L. Steele, Heat Flow of Oregon, Ore. Dept. Geol. Min. Indust. Special Paper 4, 42 pp, 1978.
- Bowen, R. G., and D. D. Blackwell, The Cow Hollow geothermal anomaly, Malheur, County, Oregon, The Ore Bin, 37, 109-121, 1975.
- Gannett, M. W., Hydrologic assessment of the developed geothermal aquifer near Vale, Oregon, Ore. Water Res. Dept. Open-file Report 88-04, 42pp, 1986
- Sass, J. H., A. H. Lachenbruch, R. J. Munroe, G. W. Green, and T. H. Moses, Jr., Heat flow in the western United States, J. Geophys. Res., 76, 6356-6431, 1971

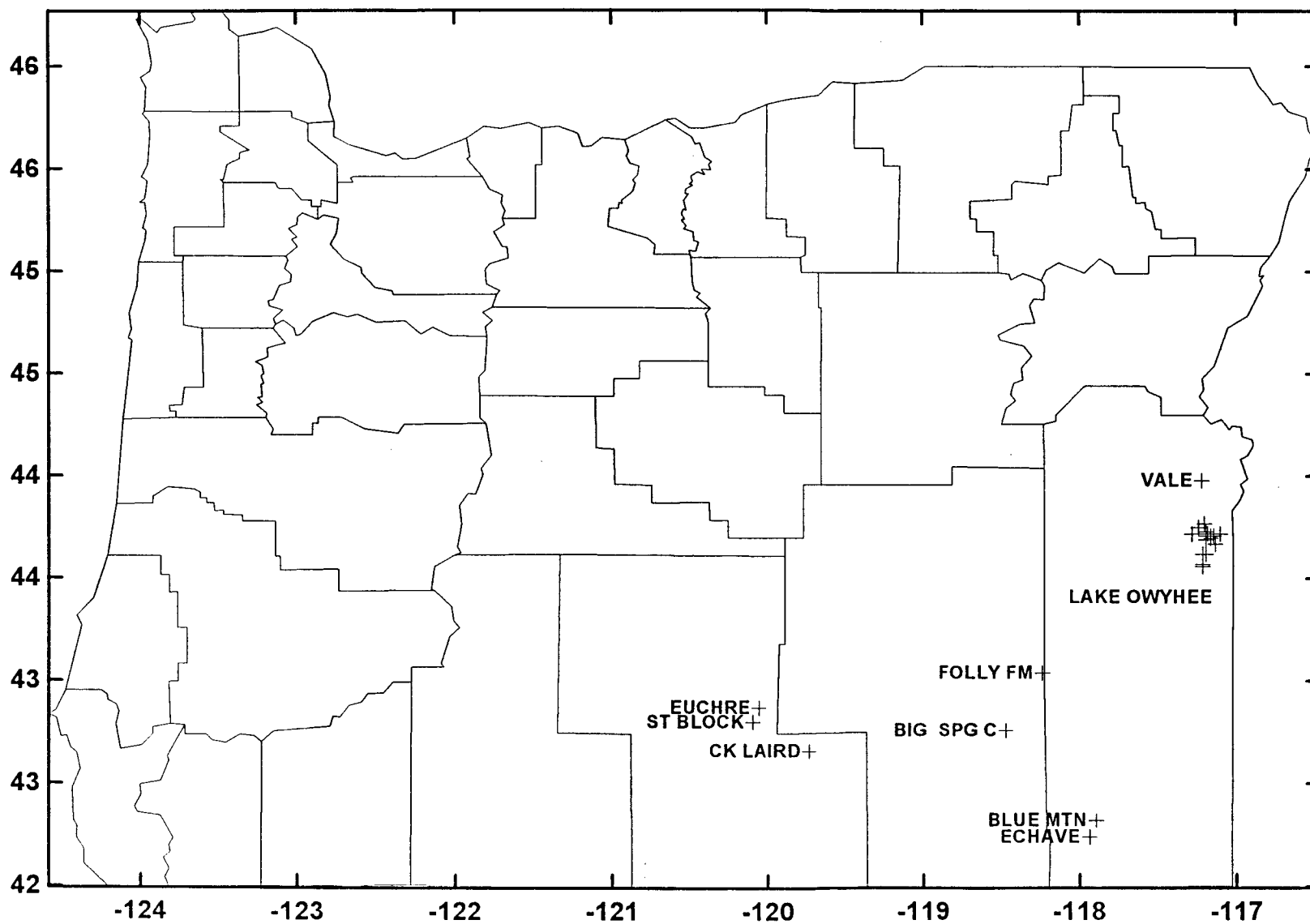


Figure 1. Location of wells with temperature-depth data listed in this data release.

Table 1. Location of wells included in data release.

Name	Log Date	T/R/S Loc	Lat	Long
Gannett (1988) Wells				
OTM-1	10/16/86	18S/45E-20DDB	43 58.75	117 13.75
OTM-2	10/16/86	18S/45E-20DDB	43 58.75	117 13.75
OTM-4	10/16/86	18S/45E-20DDC	43 58.75	117 13.75
<i>use</i> OTM-5	10/16/86	18S/45E-20DDC	43 58.75	117 13.75
ANTHONY1	10/16/86	18S/45E-20DCD	43 58.75	117 13.75
ANTH-HAW	9/17/86	18S/45E-20DCD	43 58.75	117 13.75
BUTLERR2	4/30/86	18S/45E-20DCD	43 58.75	117 13.75
BUTLERR1	9/17/86	18S/45E-20DCD	43 58.75	117 13.75
BUTLERR1	1986	18S/45E-20DCD	43 58.75	117 13.75
VF-1	1986	18S/45E-20DDC	43 58.75	117 13.75
VF-2	1986	18S/45E-20DDC	43 58.75	117 13.75
HUMDRYER	10/16/86	18S/45E-20DCD	43 58.75	117 13.75
HYSELL	1986	18S/45E-20DCD	43 58.75	117 13.75
BUTLER2	1986	18S/45E-20DCD	43 58.75	117 13.75
BUTLER4	5/ 7/86	18S/45E-20DCD	43 58.75	117 13.75
BUTLER3	1986	18S/45E-20DCD	43 58.75	117 13.75
BUTLER5	5/ 1/86	18S/45E-20DCD	43 58.75	117 13.75
BUTLER6	5/ 1/86	18S/45E-20DCD	43 58.75	117 13.75
Hunt wells				
<i>own</i> 81-5101 <i>data</i>	7/14/81	21S/45E- 3CCA	43 46.18	117 12.38
81-5102	7/16/81	21S/45E-17BDC	43 44.83	117 14.83
81-5104	7/17/81	21S/44E-26AAD	43 43.01	117 17.65
81-5105	8/10/81	21S/45E-26BBA	43 43.30	117 11.35
80-5106	6/29/80	21S/46E-21CDC	43 43.45	117 06.53
80-5107	7/14/80	21S/46E-30CBC	43 42.78	117 09.18
80-5111	7/13/80	22S/46E- 7ADA	43 40.43	117 08.23
80-5116	7/ 7/80	22S/45E-28AAC	43 37.09	117 12.95
80-5117	7/ 4/80	22S/45E-34AAC	43 37.15	117 11.85
80-5120	6/28/80	23S/45E- 9DCA	43 34.08	117 13.13
80-5122	7/ 4/80	23S/45E-21ACA	43 33.51	117 13.16
81-5165	7/28/81	21S/45E-25CBB	43 42.85	117 10.33
81-5167	7/31/81	21S/45E-36BDA	43 42.02	117 09.91
81-5172	7/21/81	21S/45E-22ACB	43 43.95	117 11.76
81-5173	8/ 7/81	21S/45E-34BAD	43 42.33	117 12.25
81-5175A	8/ 3/81	22S/45E- 2BAB	43 41.57	117 11.73
Oregon 1993 wells				
EUCHRE	9/13/93	31S/23E-30BBB	42 52.00	120 3.40
ST BLOCK	9/13/93	32S/22E-14CAB	42 47.83	120 6.00
BIG SPG C	9/ 6/93	32S/34E-13CBC	42 45.50	118 28.00
CK LAIRD	9/13/93	33S/25E-35CBA	42 39.83	119 44.50
BLUE MTN	9/ 4/93	37S/41E-33AD	42 19.00	117 54.25
ECHAVE	9/ 4/93	38S/41E-32BB	42 14.25	117 56.33
FOLLY FM	9/ 5/93	39S/36E-24CA	43 2.33	118 14.17

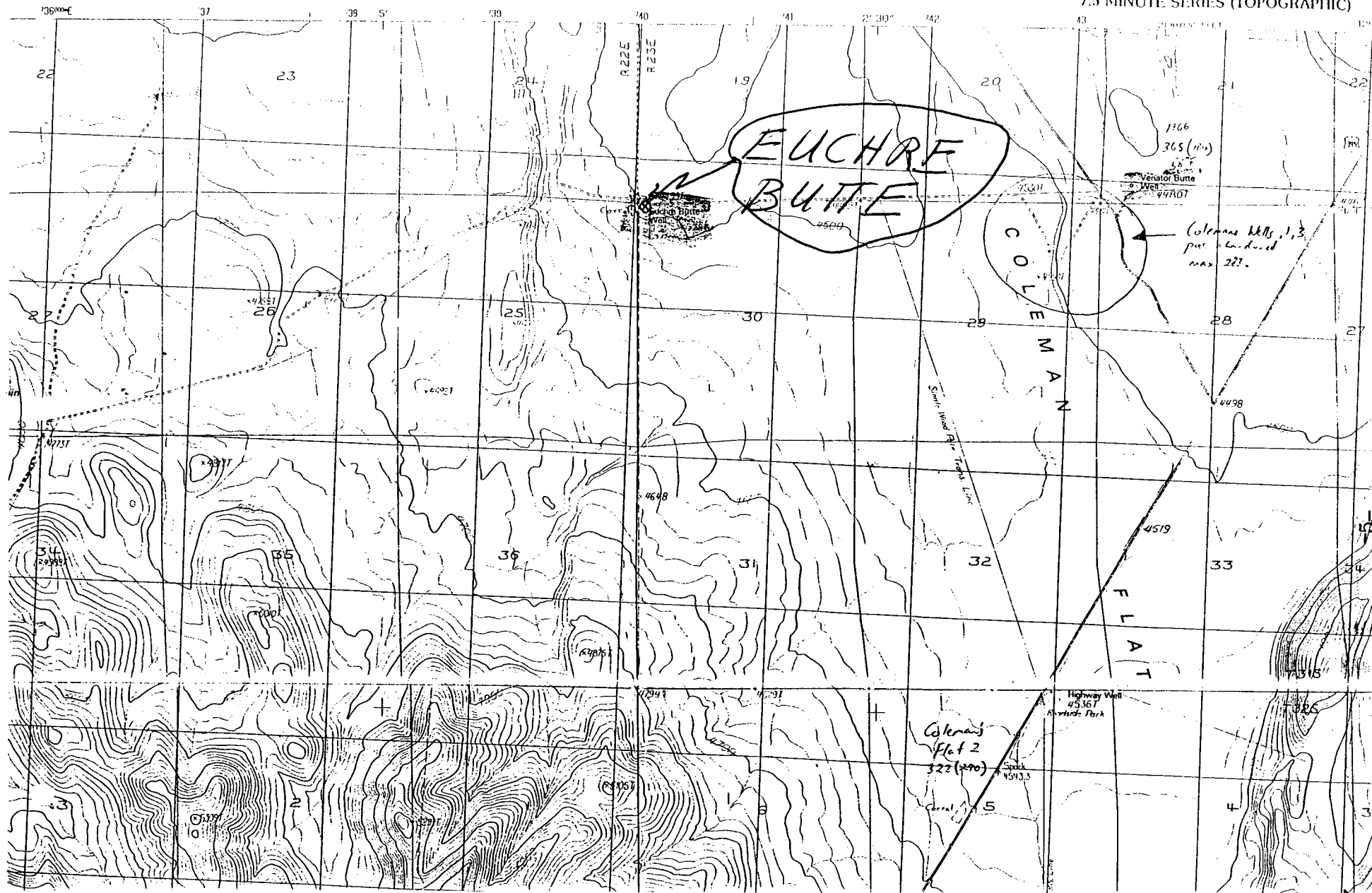
# ***OREGON (1993) WELL LOGS***

***Data Collection by***

***Robert Langridge***

***Oregon Department of Geology and Mineral Industries***





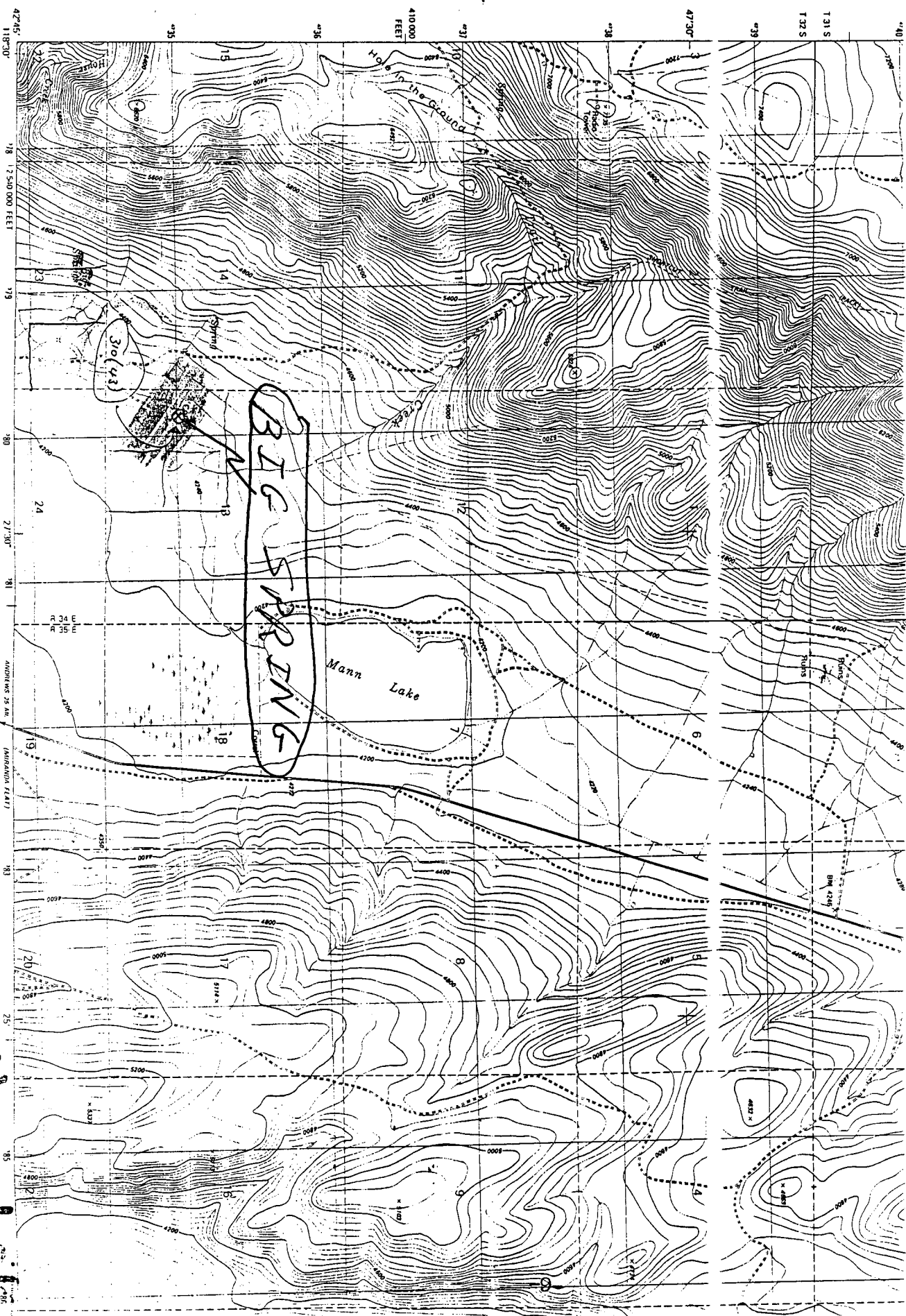
LOCATION: Adel AMS, Oregon  
T/R-S: 31s23e30bbb  
HOLE NAME: Euchre  
DATE MEASURED: 9-13-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
5.0	12.330	0.0
10.0	12.800	94.0
15.0	13.240	88.0
20.0	13.370	26.0
25.0	13.620	50.0
30.0	14.040	84.0
33.0	14.270	76.7



LOCATION: Adel AMS, Ore.  
T/R-S: 32s22e14cab  
HOLE NAME: StBlok  
DATE MEASURED: 9-13-93

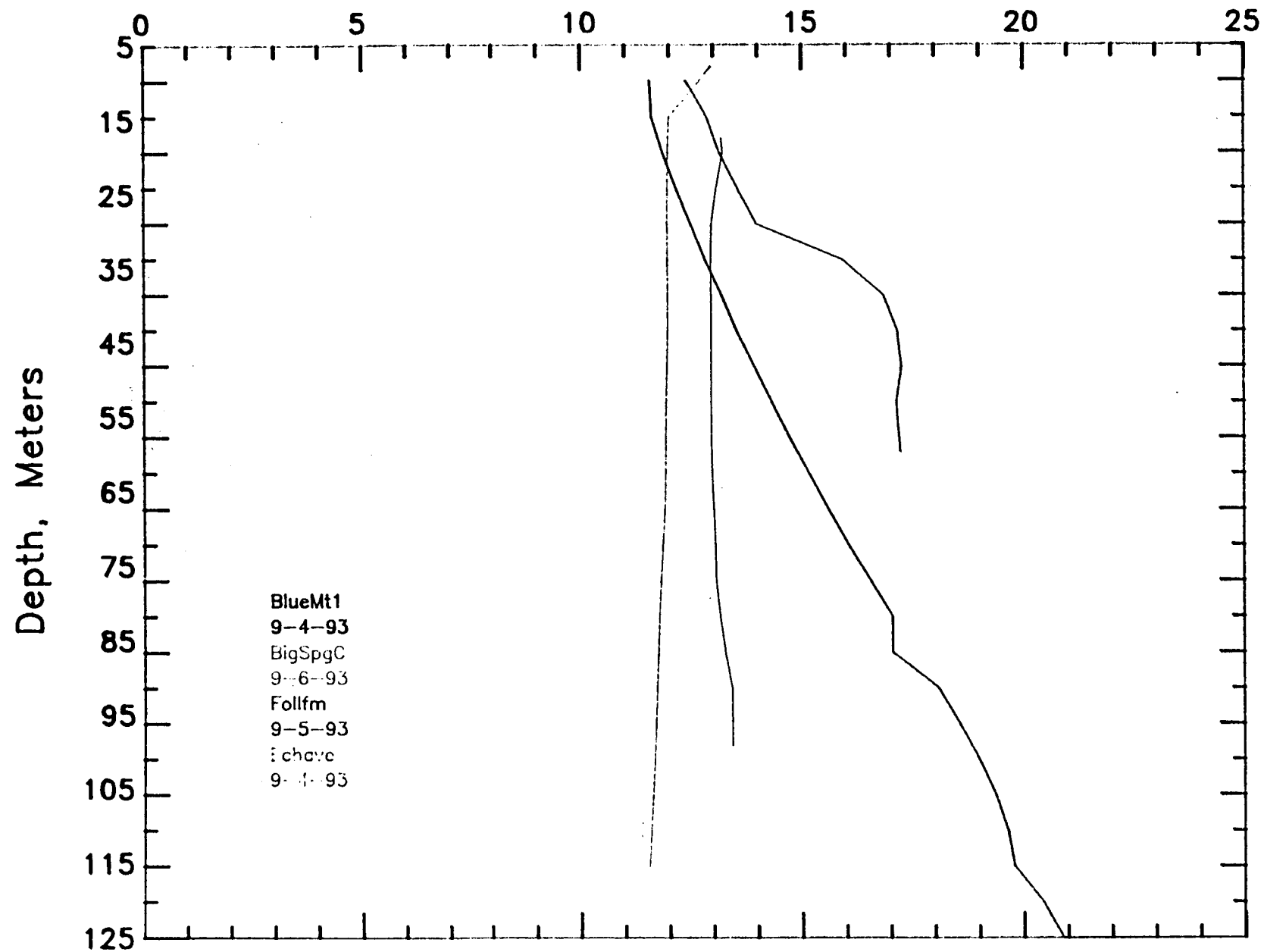
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
7.0	11.830	0.0
10.0	12.070	80.0
15.0	12.210	28.0
20.0	12.290	16.0
25.0	12.470	36.0
30.0	12.640	34.0
35.0	12.830	38.0
40.0	13.000	34.0
45.0	13.220	44.0
50.0	13.440	44.0
55.0	13.670	46.0
60.0	13.940	54.0
65.0	14.220	56.0
70.0	14.500	56.0
75.0	14.760	52.0
80.0	14.980	44.0
85.0	15.200	44.0
90.0	15.420	44.0
95.0	15.650	46.0
100.0	15.880	46.0
105.0	16.240	72.0
110.0	16.430	38.0
115.0	16.640	42.0

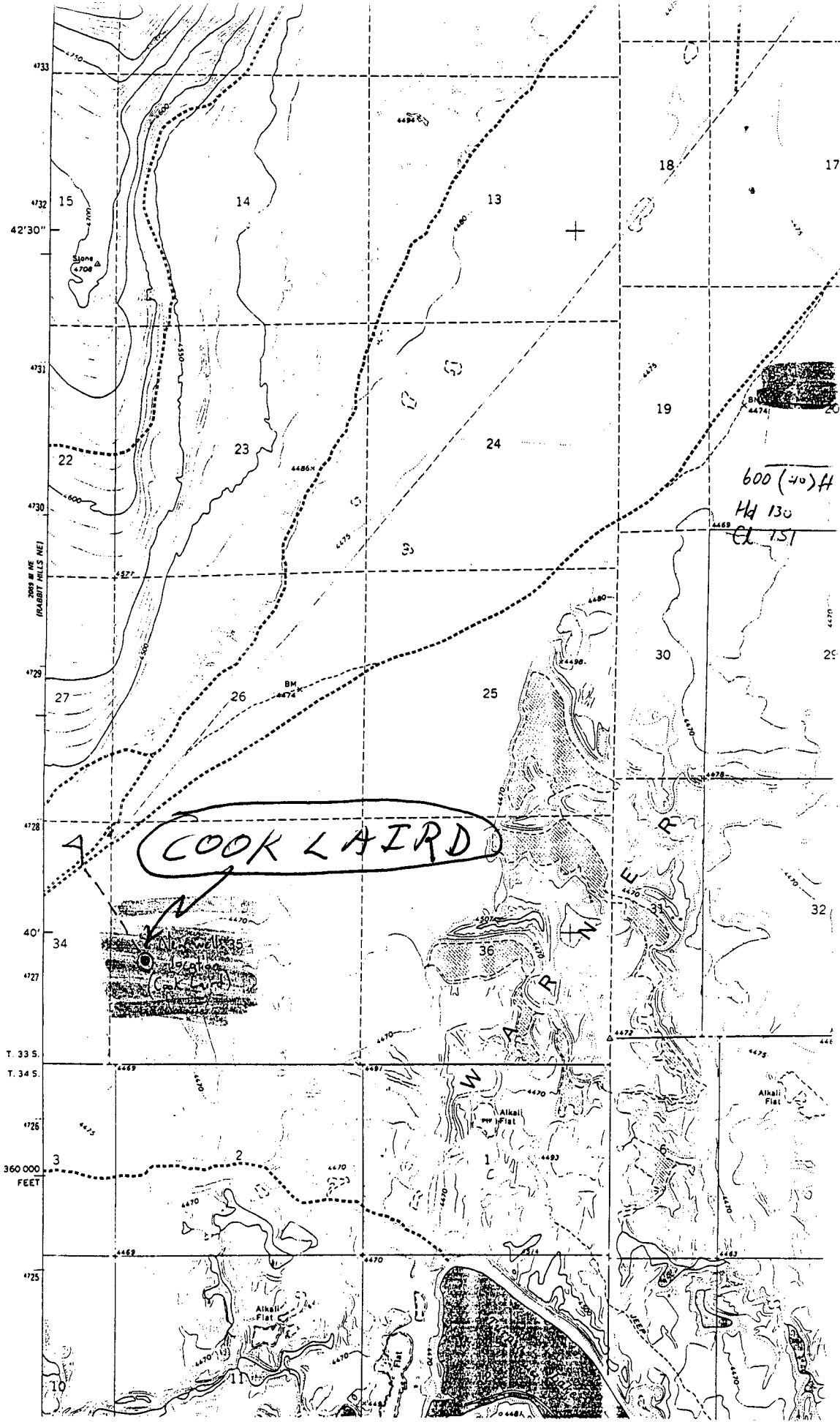


LOCATION: Adel AMS, Ore.  
T/R-S: 32s34e13cbc  
HOLE NAME: BigSpgC  
DATE MEASURED: 9-6-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
13.0	13.180	0.0
15.0	13.210	15.0
20.0	13.060	-30.0
25.0	12.950	-22.0
30.0	12.935	-3.0
35.0	12.940	1.0
40.0	12.940	0.0
45.0	12.940	0.0
50.0	12.940	0.0
55.0	12.945	1.0
60.0	12.960	3.0
65.0	13.000	8.0
70.0	13.030	6.0
75.0	13.050	4.0
80.0	13.140	18.0
85.0	13.250	22.0
90.0	13.400	30.0
98.0	13.405	0.6

# Temperature, Deg C



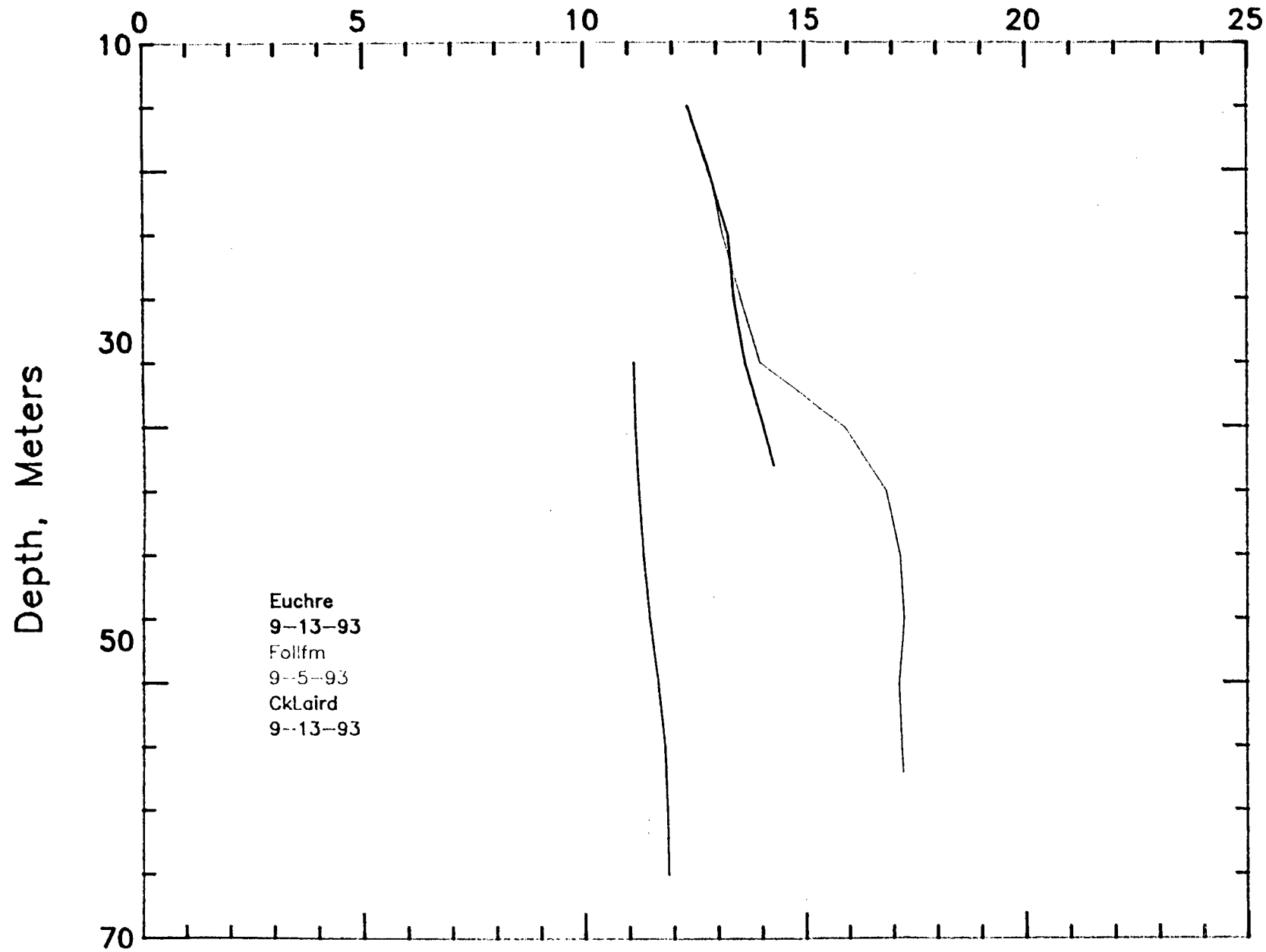


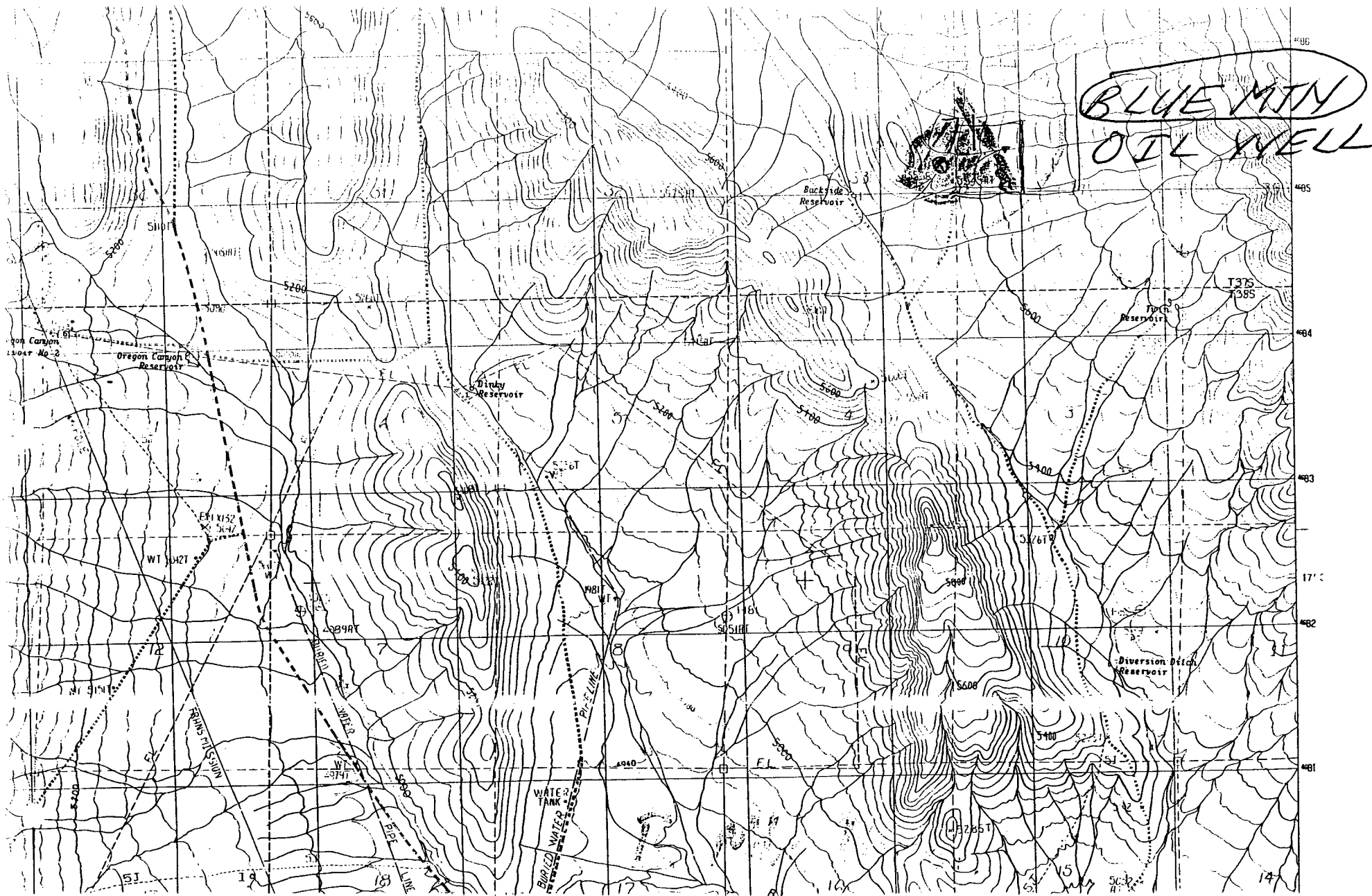


LOCATION: Adel AMS, Ore  
T/R-S: 33s25e35cba  
HOLE NAME: CkLaird  
DATE MEASURED: 9-13-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
25.0	11.110	0.0
30.0	11.150	8.0
35.0	11.230	16.0
40.0	11.330	20.0
45.0	11.470	28.0
50.0	11.650	36.0
55.0	11.800	30.0
60.0	11.850	10.0
65.0	11.870	4.0

Temperature, Deg C





LOCATION: Jordan Valley AMS, Ore.  
T/R-S: 37s41e33ad  
HOLE NAME: BlueMt1  
DATE MEASURED: 9-4-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
5.0	11.540	0.0
10.0	11.580	8.0
15.0	11.840	52.0
20.0	12.140	60.0
25.0	12.460	64.0
30.0	12.800	68.0
35.0	13.180	76.0
40.0	13.510	66.0
45.0	13.910	80.0
50.0	14.310	80.0
55.0	14.710	80.0
60.0	15.150	88.0
65.0	15.590	88.0
70.0	16.040	90.0
75.0	16.540	100.0
80.0	17.030	98.0
85.0	17.030	0.0
90.0	18.070	208.0
95.0	18.540	94.0
100.0	18.980	88.0
105.0	19.360	76.0
110.0	19.630	54.0
115.0	19.780	30.0
120.0	20.440	132.0
125.0	20.890	90.0
130.0	21.400	102.0
135.0	21.800	80.0
140.0	22.180	76.0
145.0	22.500	64.0
150.0	22.800	60.0
155.0	23.200	80.0
160.0	23.610	82.0
165.0	23.930	64.0
170.0	24.280	70.0
175.0	24.680	80.0
180.0	25.080	80.0
185.0	25.470	78.0
190.0	25.850	76.0
195.0	26.200	70.0
200.0	26.540	68.0
205.0	26.920	76.0

LOCATION: Jordan Valley AMS, Ore.  
T/R-S: 37s41e33ad  
HOLE NAME: BlueMt1  
DATE MEASURED: 9-4-93

PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
210.0	27.220	60.0
215.0	27.600	76.0
220.0	27.980	76.0
225.0	28.330	70.0
230.0	28.630	60.0
235.0	29.000	74.0
240.0	29.330	66.0
245.0	29.630	60.0
250.0	29.940	62.0
255.0	30.260	64.0
260.0	30.670	82.0
265.0	31.020	70.0
270.0	31.310	58.0
275.0	31.590	56.0
280.0	31.880	58.0
285.0	32.170	58.0
290.0	32.450	56.0
295.0	32.740	58.0
300.0	33.010	54.0
305.0	33.280	54.0
310.0	33.570	58.0
315.0	33.850	56.0
320.0	34.120	54.0
325.0	34.380	52.0
330.0	34.620	48.0
335.0	34.840	44.0
340.0	35.070	46.0
345.0	35.270	40.0
350.0	35.480	42.0
355.0	35.690	42.0
360.0	35.890	40.0
365.0	36.090	40.0
370.0	36.360	54.0
375.0	36.470	22.0
380.0	36.660	38.0
385.0	36.830	34.0
390.0	37.020	38.0
395.0	37.220	40.0
400.0	37.400	36.0
405.0	37.560	32.0
410.0	37.770	42.0

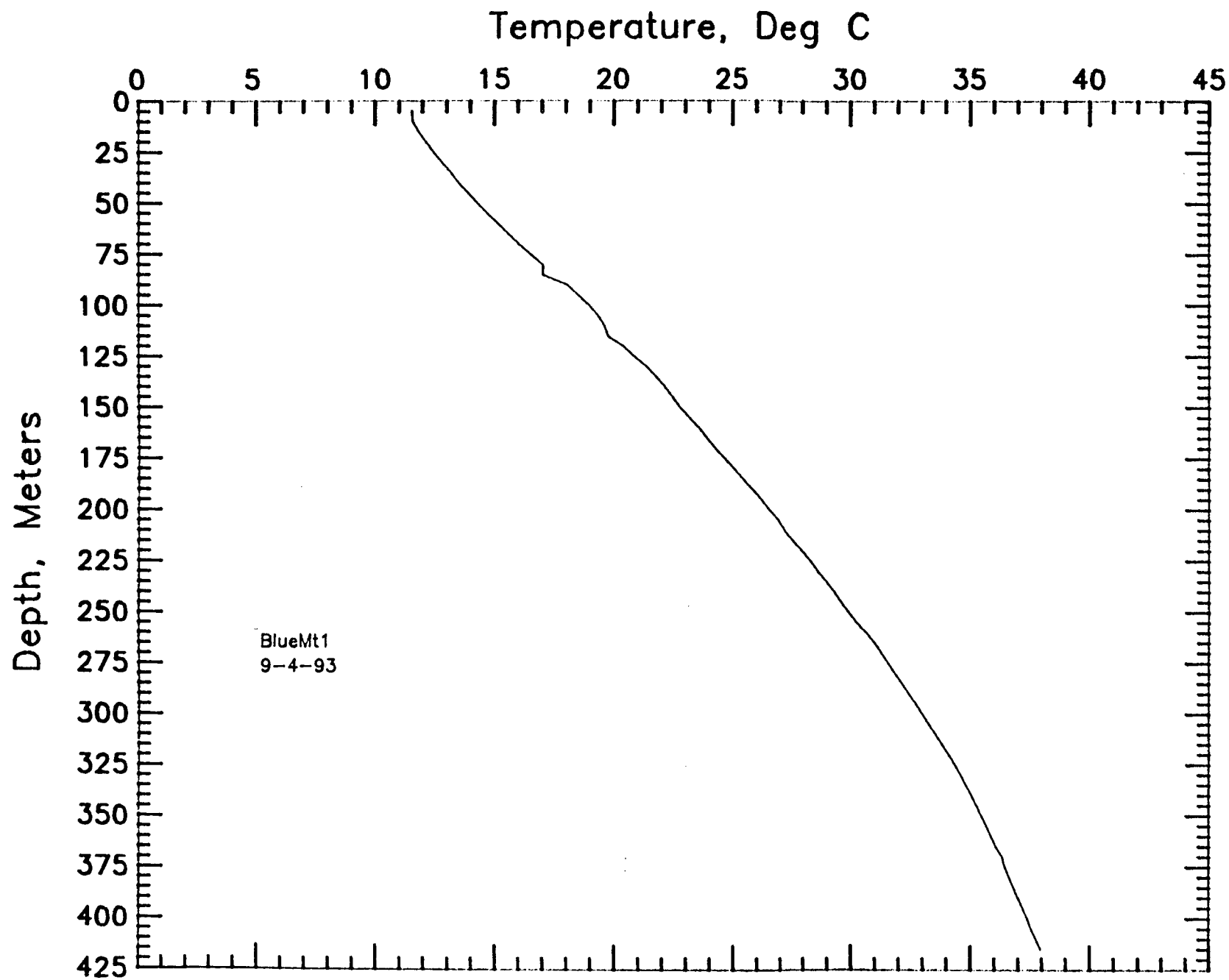
LOCATION: Jordan Valley AMS, Ore.  
T/R-S: 37s41e33ad  
HOLE NAME: BlueMt1  
DATE MEASURED: 9-4-93

PAGE 3

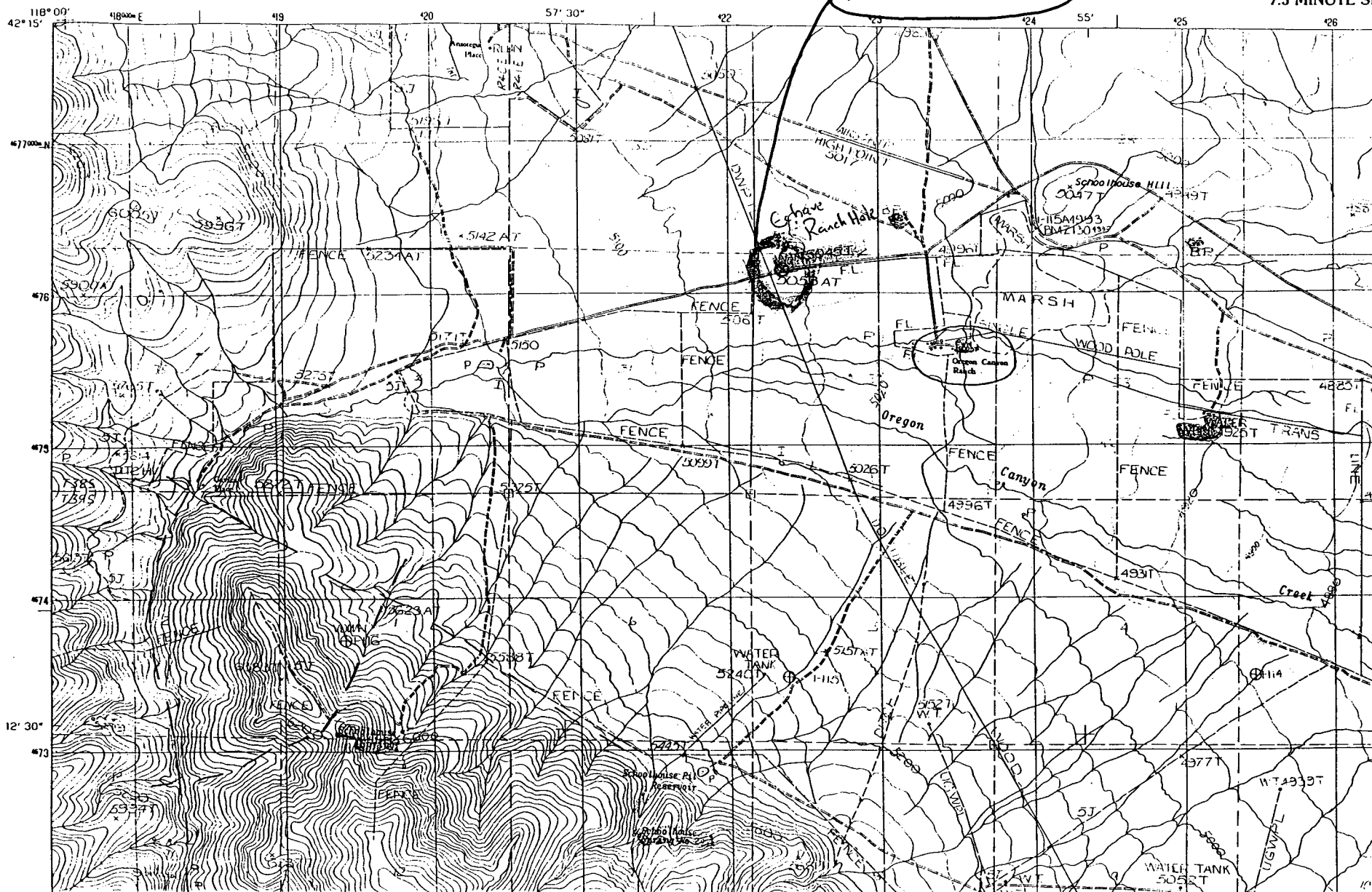
DEPTH	TEMPERATURE	GRADIENT
METERS	DEG C	DEG C/KM
415.0	37.960	38.0

LOCATION: Jordan Valley AMS, Ore.  
T/R-S: 37s41e33ad  
HOLE NAME: BlueM2  
DATE MEASURED: 9-4-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
5.0	11.540	0.0
10.0	11.580	8.0
15.0	11.830	50.0
20.0	12.100	54.0
25.0	12.450	70.0
30.0	12.770	64.0
35.0	13.140	74.0
40.0	13.510	74.0
45.0	13.880	74.0
50.0	14.310	86.0
55.0	14.730	84.0
60.0	15.120	78.0
65.0	15.330	42.0
70.0	16.000	134.0
75.0	16.530	106.0
80.0	17.050	104.0
85.0	17.250	40.0
87.0	17.250	0.0



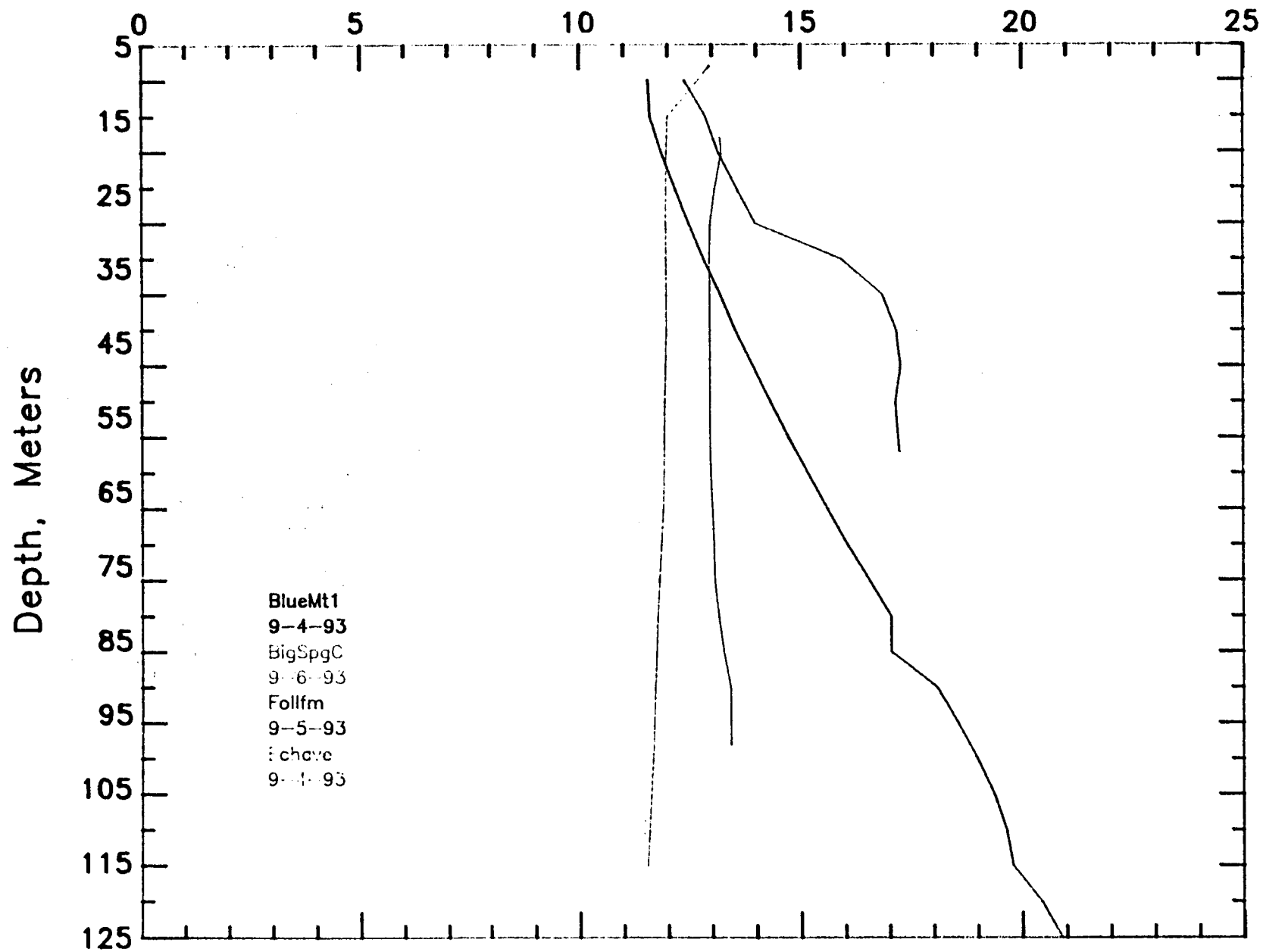




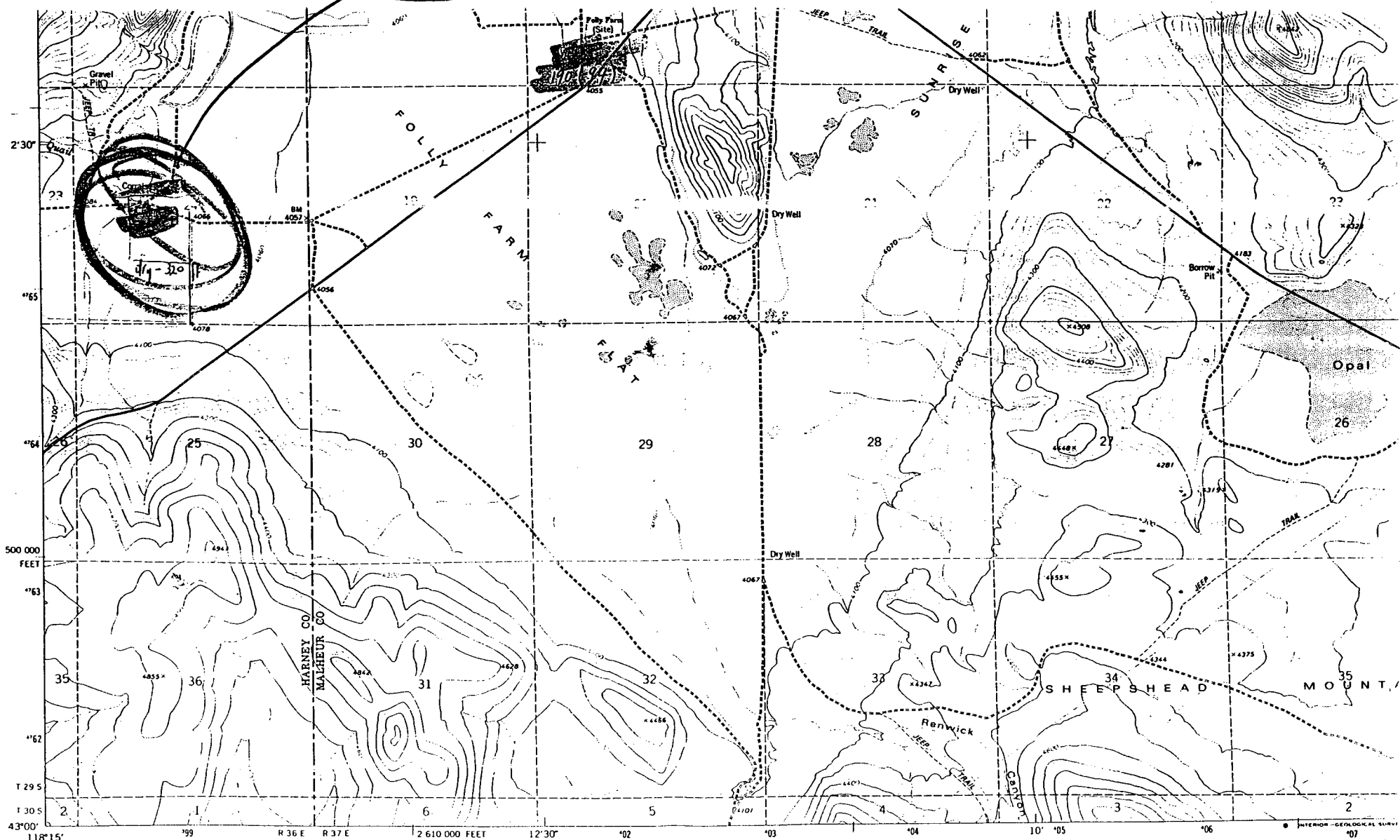
LOCATION: Oregon Canyon Ranch  
T/R-S: 38s41e32bb  
HOLE NAME: Echave  
DATE MEASURED: 9-4-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	12.945	0.0
5.0	12.680	-132.5
10.0	12.000	-136.0
15.0	11.975	-5.0
20.0	11.965	-2.0
25.0	11.960	-1.0
30.0	11.965	1.0
35.0	11.970	1.0
40.0	11.970	0.0
45.0	11.950	-4.0
50.0	11.930	-4.0
55.0	11.920	-2.0
60.0	11.915	-1.0
65.0	11.895	-4.0
70.0	11.850	-9.0
75.0	11.805	-9.0
80.0	11.765	-8.0
85.0	11.740	-5.0
90.0	11.705	-7.0
95.0	11.680	-5.0
100.0	11.645	-7.0
105.0	11.600	-9.0
110.0	11.560	-8.0
115.0	11.520	-8.0

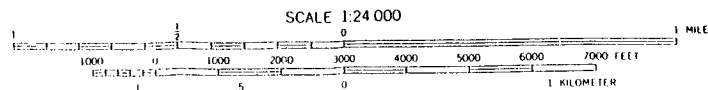
Temperature, Deg C



FOLLY FARM



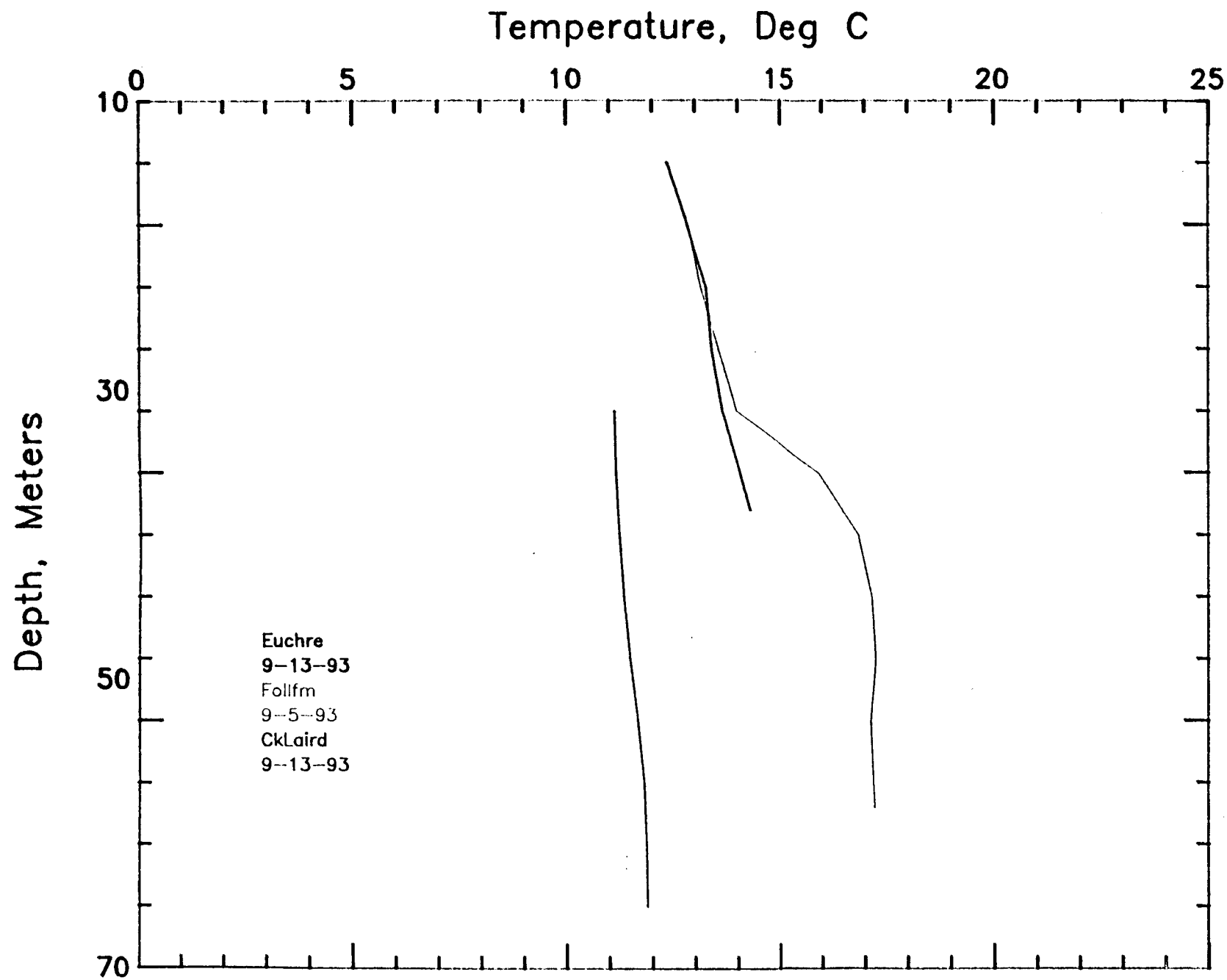
Mapped, edited, and published by the Geological Survey  
Control by USGS and NOS/NOAA  
Topography by photogrammetric methods from aerial  
photographs taken 1973. Field checked 1974



ROAD CLASSII  
Primary highway, hard surface  
Secondary highway, hard surface

LOCATION: Burns AMS, Ore.  
T/R-S: 39s36e24ca  
HOLE NAME: Follfm  
DATE MEASURED: 9-5-93

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
5.0	12.370	0.0
10.0	12.850	96.0
15.0	13.140	58.0
20.0	13.550	82.0
25.0	13.980	86.0
30.0	15.920	388.0
35.0	16.860	188.0
40.0	17.170	62.0
45.0	17.260	18.0
50.0	17.140	-24.0
57.0	17.230	12.9



## ***GANNETT (1988) WELL LOGS***

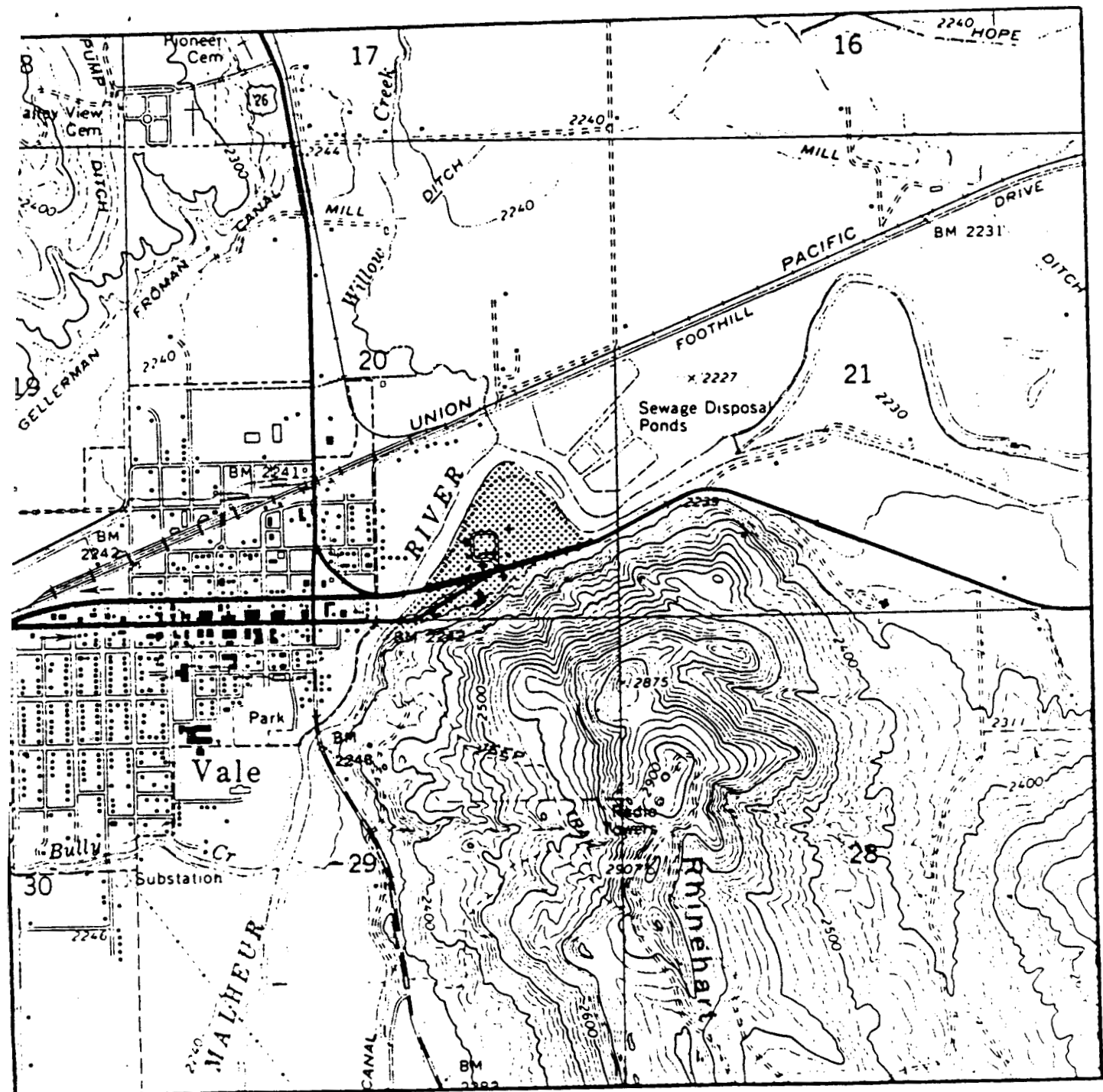
Table 1. INFORMATION ON SELECTED WELLS IN THE VALE GEOTHERMAL AREA

<u>Well Number</u>	<u>Owner</u>	<u>Depth</u>	<u>Production Temp. (°F)</u>	<u>Yield (gpm)</u>	<u>Max. Down Hole Temp °F*</u>
A-1	Anthony	680	200	15	213
A-2	Anthony	30	110	24	-
B-1	Butler	?	220	200	215
B-2	Butler**	140	200-210	125-200	229
B-3	Butler	170	200	200	230
B-4	Butler**	140	200-210	125-200	229
B-5	Butler	140	?	80	227
B-6	Butler	?	?	?	223
B-R1	Butler	100	112	30	187
B-R2	Butler	100	120	20	148
F-1	Fuhriman	24	54	12	-
F-2	Fuhriman	106	67	24	-
GH-1	Butler (?)	?	?	?	-
HA-1	Hammond	125	225	550	-
HA-2	Hammond	120	220	640	-
HU-D	Ag-Dryers	140	215	100	183
HU-R	Humphrey	23	170	25	-
OTM-1	Oregon Trail	850	210	9	213
OTM-2	Oregon Trail	600	180	250(?)	189
OTM-3	Oregon Trail	50	184	250	-
OTM-4	DeLong	80	215	300	198
OTM-5	DeLong	250	220	250	211
OTM-R1	Oregon Trail	200	80	60	-
OTM-R2	Oregon Trail	200	78	45	-
OTM-R3	Oregon Trail	220	?	?	-
OTM-R4	Oregon Trail	355	?	?	-
OTM-R5	Oregon Trail	210	?	60	-
VF-1	Oregon Trail	50	192	80	170
VF-2	Oregon Trail	27	?	20	168

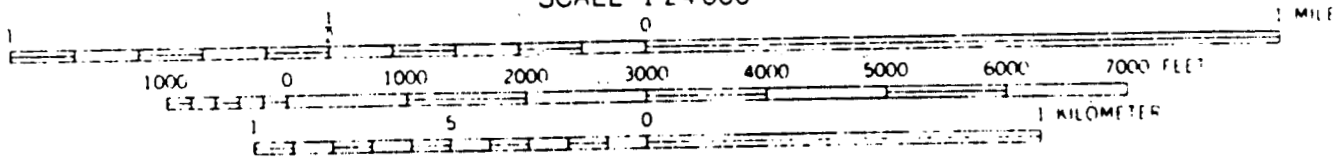
\* Maximum down-hole temperatures measured by OWRD

\*\* Unclear which log goes with which well





SCALE 1:24,000



CONTOUR INTERVAL 20 FEET  
 DOTTED LINES REPRESENT 10 FOOT CONTOURS  
 DATUM IS MEAN SEA LEVEL

0°08' 2 MILS

19° 33R M

Figure 2. LOCATION OF THE DEVELOPED GEOTHERMAL AREA (Shaded)

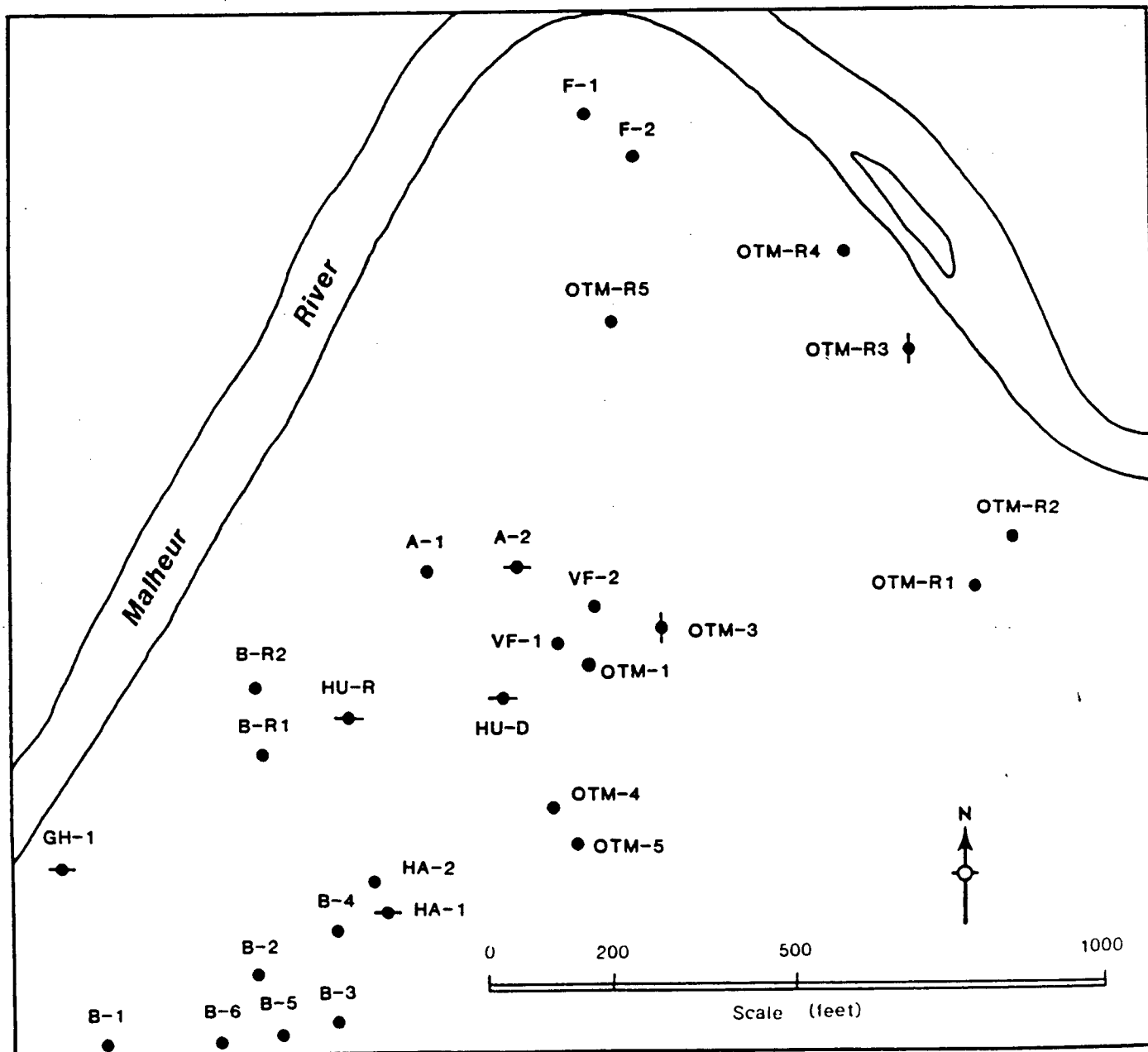


Figure 3. LOCATION AND NUMBERS OF THE WELLS USED IN THIS STUDY.  
Wells with horizontal lines are active production wells, wells with  
vertical lines are active injection wells.

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: ANTHONY1  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
2.0	6.6	45.450	113.81	0.0	0.0
4.0	13.1	46.850	116.33	700.0	38.4
6.0	19.7	47.450	117.41	300.0	16.5
8.0	26.2	48.990	120.18	770.0	42.3
10.0	32.8	50.140	122.25	575.0	31.6
12.0	39.4	50.780	123.40	320.0	17.6
14.0	45.9	52.030	125.65	625.0	34.3
16.0	52.5	53.230	127.81	600.0	32.9
18.0	59.1	54.340	129.81	555.0	30.5
20.0	65.6	55.380	131.68	520.0	28.5
22.0	72.2	56.650	133.97	635.0	34.8
24.0	78.7	57.600	135.68	475.0	26.1
26.0	85.3	58.890	138.00	645.0	35.4
28.0	91.9	59.950	139.91	530.0	29.1
30.0	98.4	60.770	141.39	410.0	22.5
32.0	105.0	62.070	143.73	650.0	35.7
34.0	111.5	63.240	145.83	585.0	32.1
36.0	118.1	64.250	147.65	505.0	27.7
38.0	124.7	65.280	149.50	515.0	28.3
40.0	131.2	66.110	151.00	415.0	22.8
42.0	137.8	66.680	152.02	285.0	15.6
44.0	144.4	67.520	153.54	420.0	23.0
46.0	150.9	68.250	154.85	365.0	20.0
48.0	157.5	69.010	156.22	380.0	20.9
50.0	164.0	69.620	157.32	305.0	16.7
52.0	170.6	70.280	158.50	330.0	18.1
54.0	177.2	70.820	159.48	270.0	14.8
56.0	183.7	71.390	160.50	285.0	15.6
58.0	190.3	72.000	161.60	305.0	16.7
60.0	196.9	72.500	162.50	250.0	13.7
62.0	203.4	72.900	163.22	200.0	11.0
64.0	210.0	73.430	164.17	265.0	14.5
66.0	216.5	73.870	164.97	220.0	12.1
68.0	223.1	74.290	165.72	210.0	11.5
70.0	229.7	74.560	166.21	135.0	7.4
72.0	236.2	75.070	167.13	255.0	14.0
74.0	242.8	75.470	167.85	200.0	11.0
76.0	249.3	75.970	168.75	250.0	13.7
78.0	255.9	76.400	169.52	215.0	11.8
80.0	262.5	76.850	170.33	225.0	12.3

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: ANTHONY1  
DATE MEASURED: 10/16/86

PAGE 2

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
82.0	269.0	77.360	171.25	255.0	14.0
84.0	275.6	77.780	172.00	210.0	11.5
86.0	282.2	78.160	172.69	190.0	10.4
88.0	288.7	78.620	173.52	230.0	12.6
90.0	295.3	79.070	174.33	225.0	12.3
92.0	301.8	79.550	175.19	240.0	13.2
94.0	308.4	80.000	176.00	225.0	12.3
96.0	315.0	80.310	176.56	155.0	8.5
98.0	321.5	80.860	177.55	275.0	15.1
100.0	328.1	81.270	178.29	205.0	11.3
102.0	334.6	81.730	179.11	230.0	12.6
104.0	341.2	82.120	179.82	195.0	10.7
106.0	347.8	82.600	180.68	240.0	13.2
108.0	354.3	82.870	181.17	135.0	7.4
110.0	360.9	83.270	181.89	200.0	11.0
112.0	367.5	83.610	182.50	170.0	9.3
114.0	374.0	84.130	183.43	260.0	14.3
116.0	380.6	84.520	184.14	195.0	10.7
118.0	387.1	84.990	184.98	235.0	12.9
120.0	393.7	85.470	185.85	240.0	13.2
122.0	400.3	85.890	186.60	210.0	11.5
124.0	406.8	86.320	187.38	215.0	11.8
126.0	413.4	86.760	188.17	220.0	12.1
128.0	419.9	87.160	188.89	200.0	11.0
130.0	426.5	87.620	189.72	230.0	12.6
132.0	433.1	87.990	190.38	185.0	10.2
134.0	439.6	88.400	191.12	205.0	11.3
136.0	446.2	88.470	191.25	35.0	1.9
138.0	452.8	89.360	192.85	445.0	24.4
140.0	459.3	89.760	193.57	200.0	11.0
142.0	465.9	90.200	194.36	220.0	12.1
144.0	472.4	90.550	194.99	175.0	9.6
146.0	479.0	88.970	192.15	-790.0	-43.4
148.0	485.6	91.330	196.39	1180.0	64.8
150.0	492.1	91.730	197.11	200.0	11.0
152.0	498.7	92.170	197.91	220.0	12.1
154.0	505.2	92.560	198.61	195.0	10.7
156.0	511.8	92.840	199.11	140.0	7.7
158.0	518.4	93.240	199.83	200.0	11.0
160.0	524.9	93.560	200.41	160.0	8.8

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: ANTHONY1  
DATE MEASURED: 10/16/86

PAGE 3

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
162.0	531.5	93.970	201.15	205.0	11.3
164.0	538.1	94.360	201.85	195.0	10.7
166.0	544.6	94.570	202.23	105.0	5.8
168.0	551.2	94.950	202.91	190.0	10.4
170.0	557.7	95.180	203.32	115.0	6.3
172.0	564.3	95.530	203.95	175.0	9.6
174.0	570.9	95.770	204.39	120.0	6.6
176.0	577.4	96.840	206.31	535.0	29.4
178.0	584.0	97.120	206.82	140.0	7.7
180.0	590.6	97.180	206.92	30.0	1.6
182.0	597.1	97.250	207.05	35.0	1.9
184.0	603.7	97.920	208.26	335.0	18.4
186.0	610.2	98.230	208.81	155.0	8.5
188.0	616.8	98.380	209.08	75.0	4.1
190.0	623.4	98.720	209.70	170.0	9.3
192.0	629.9	99.060	210.31	170.0	9.3
194.0	636.5	99.250	210.65	95.0	5.2
196.0	643.0	99.430	210.97	90.0	4.9
198.0	649.6	99.770	211.59	170.0	9.3
200.0	656.2	99.970	211.95	100.0	5.5
202.0	662.7	100.120	212.22	75.0	4.1
204.0	669.3	100.280	212.50	80.0	4.4
204.3	670.3	100.330	212.59	166.7	9.1

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: ANTH-HAW  
DATE MEASURED: 9/17/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
2.5	8.2	43.860	110.95	0.0	0.0
5.0	16.4	45.460	113.83	640.0	35.1
7.5	24.6	47.070	116.73	644.0	35.3
10.0	32.8	48.540	119.37	588.0	32.3
12.5	41.0	51.030	123.85	996.0	54.7
15.0	49.2	51.790	125.22	304.0	16.7
17.5	57.4	53.180	127.72	556.0	30.5
20.0	65.6	54.540	130.17	544.0	29.9
22.5	73.8	56.240	133.23	680.0	37.3
25.0	82.0	57.540	135.57	520.0	28.5
27.5	90.2	59.310	138.76	708.0	38.9
30.0	98.4	60.690	141.24	552.0	30.3
32.5	106.6	61.770	143.19	432.0	23.7
35.0	114.8	63.150	145.67	552.0	30.3
37.5	123.0	64.330	147.79	472.0	25.9
40.0	131.2	65.620	150.12	516.0	28.3
42.5	139.4	66.990	152.58	548.0	30.1
45.0	147.6	67.710	153.88	288.0	15.8
47.5	155.8	68.620	155.52	364.0	20.0
50.0	164.0	69.240	156.63	248.0	13.6
52.5	172.2	70.330	158.59	436.0	23.9
55.0	180.4	70.450	158.81	48.0	2.6
57.5	188.6	71.790	161.22	536.0	29.4
60.0	196.9	72.200	161.96	164.0	9.0
62.5	205.1	72.830	163.09	252.0	13.8
65.0	213.3	73.380	164.08	220.0	12.1
67.5	221.5	73.970	165.15	236.0	13.0
70.0	229.7	74.550	166.19	232.0	12.7
72.5	237.9	75.100	167.18	220.0	12.1
75.0	246.1	75.600	168.08	200.0	11.0
77.5	254.3	76.380	169.48	312.0	17.1
80.0	262.5	76.720	170.10	136.0	7.5
82.5	270.7	77.200	170.96	192.0	10.5
85.0	278.9	77.120	170.82	-32.0	-1.8

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLERR2  
DATE MEASURED: 4/30/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
3.0	9.8	45.910	114.64	0.0	0.0
4.0	13.1	46.290	115.32	380.0	20.9
5.0	16.4	46.460	115.63	170.0	9.3
6.0	19.7	46.580	115.84	120.0	6.6
8.0	26.2	47.230	117.01	325.0	17.8
10.0	32.8	47.840	118.11	305.0	16.7
11.0	36.1	48.100	118.58	260.0	14.3
12.0	39.4	48.330	118.99	230.0	12.6
13.0	42.7	48.860	119.95	530.0	29.1
14.0	45.9	49.120	120.42	260.0	14.3
15.0	49.2	49.590	121.26	470.0	25.8
16.0	52.5	49.930	121.87	340.0	18.7
17.0	55.8	50.050	122.09	120.0	6.6
18.0	59.1	50.460	122.83	410.0	22.5
19.0	62.3	50.740	123.33	280.0	15.4
20.0	65.6	50.980	123.76	240.0	13.2
21.0	68.9	51.240	124.23	260.0	14.3
22.0	72.2	51.530	124.75	290.0	15.9
23.0	75.5	51.620	124.92	90.0	4.9
24.0	78.7	51.870	125.37	250.0	13.7
25.0	82.0	52.150	125.87	280.0	15.4
26.0	85.3	52.330	126.19	180.0	9.9
27.0	88.6	52.430	126.37	100.0	5.5
28.0	91.9	52.540	126.57	110.0	6.0
29.0	95.1	57.960	136.33	5420.0	297.4
29.1	95.5	58.840	137.91	8800.0	482.9

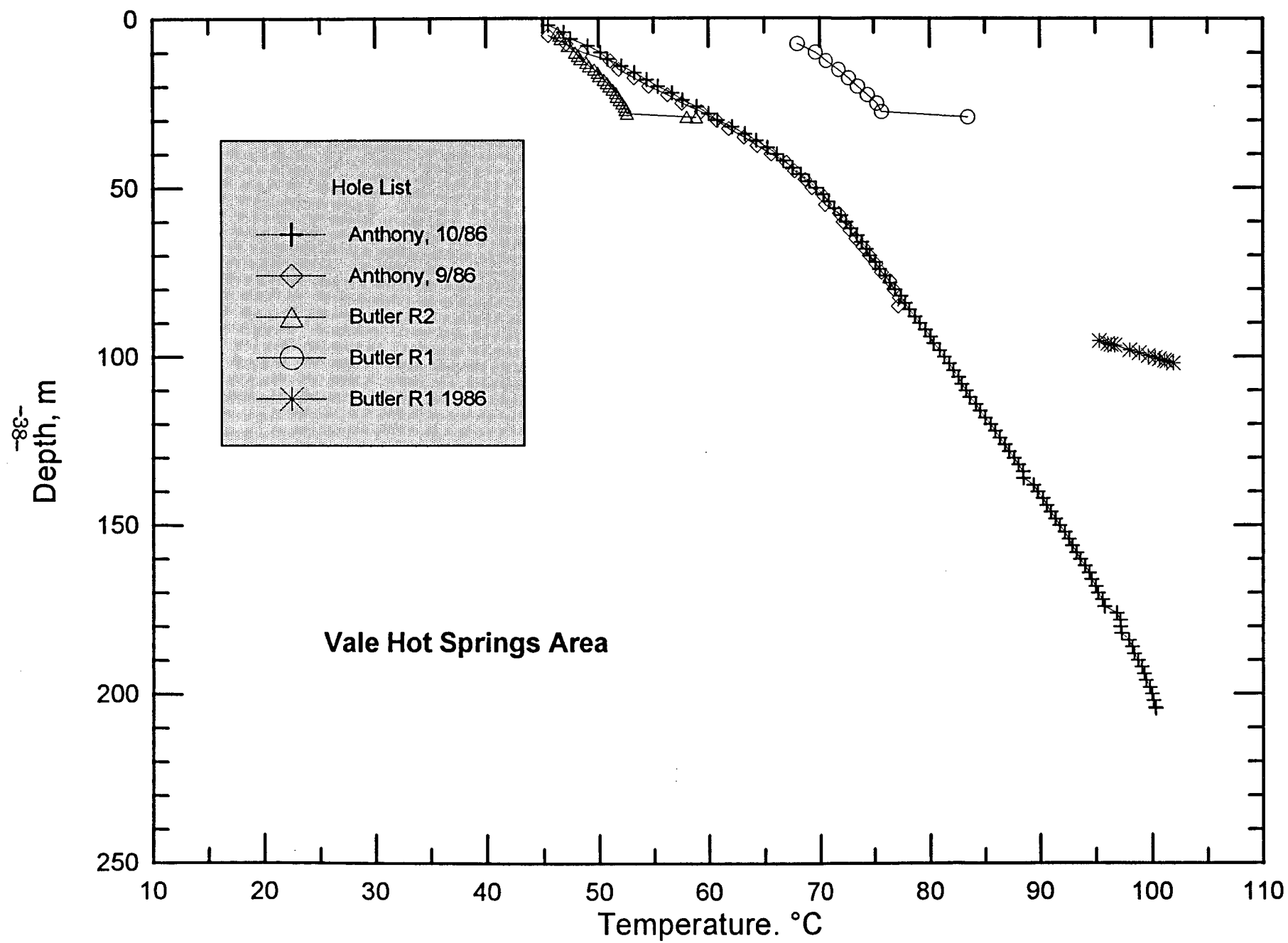
LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLERR1  
DATE MEASURED: 9/17/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
5.0	16.4	67.140	152.85	0.0	0.0
7.5	24.6	67.930	154.27	316.0	17.3
10.0	32.8	69.570	157.23	656.0	36.0
12.5	41.0	70.580	159.04	404.0	22.2
15.0	49.2	71.800	161.24	488.0	26.8
17.5	57.4	72.710	162.88	364.0	20.0
20.0	65.6	73.530	164.35	328.0	18.0
22.5	73.8	79.400	174.92	2348.0	128.9
25.0	82.0	75.240	167.43	-1664.0	-91.3
27.5	90.2	75.650	168.17	164.0	9.0
29.0	95.1	83.470	182.25	5213.3	286.1



LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLERR1  
DATE MEASURED: 1986

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
5.0	16.4	95.300	203.54	0.0	0.0
6.0	19.7	96.060	204.91	760.0	41.7
7.0	23.0	96.340	205.41	280.0	15.4
8.0	26.2	96.670	206.01	330.0	18.1
9.0	29.5	98.000	208.40	1330.0	73.0
10.0	32.8	98.840	209.91	840.0	46.1
11.0	36.1	99.660	211.39	820.0	45.0
12.0	39.4	100.300	212.54	640.0	35.1
13.0	42.7	100.630	213.13	330.0	18.1
14.0	45.9	101.320	214.38	690.0	37.9
15.0	49.2	101.100	213.98	-220.0	-12.1
15.4	50.5	101.920	215.46	2050.0	112.5



LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDC  
HOLE NAME: VF-1  
DATE MEASURED: 1986

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
2.0	6.6	73.430	164.17	0.0	0.0
3.0	9.8	73.980	165.16	550.0	30.2
4.0	13.1	74.490	166.08	510.0	28.0
5.0	16.4	74.670	166.41	180.0	9.9
6.0	19.7	74.970	166.95	300.0	16.5
7.0	23.0	75.020	167.04	50.0	2.7
8.0	26.2	75.210	167.38	190.0	10.4
9.0	29.5	75.250	167.45	40.0	2.2
10.0	32.8	75.330	167.59	80.0	4.4
10.5	34.4	75.660	168.19	660.0	36.2

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDC  
HOLE NAME: VF-2  
DATE MEASURED: 1986

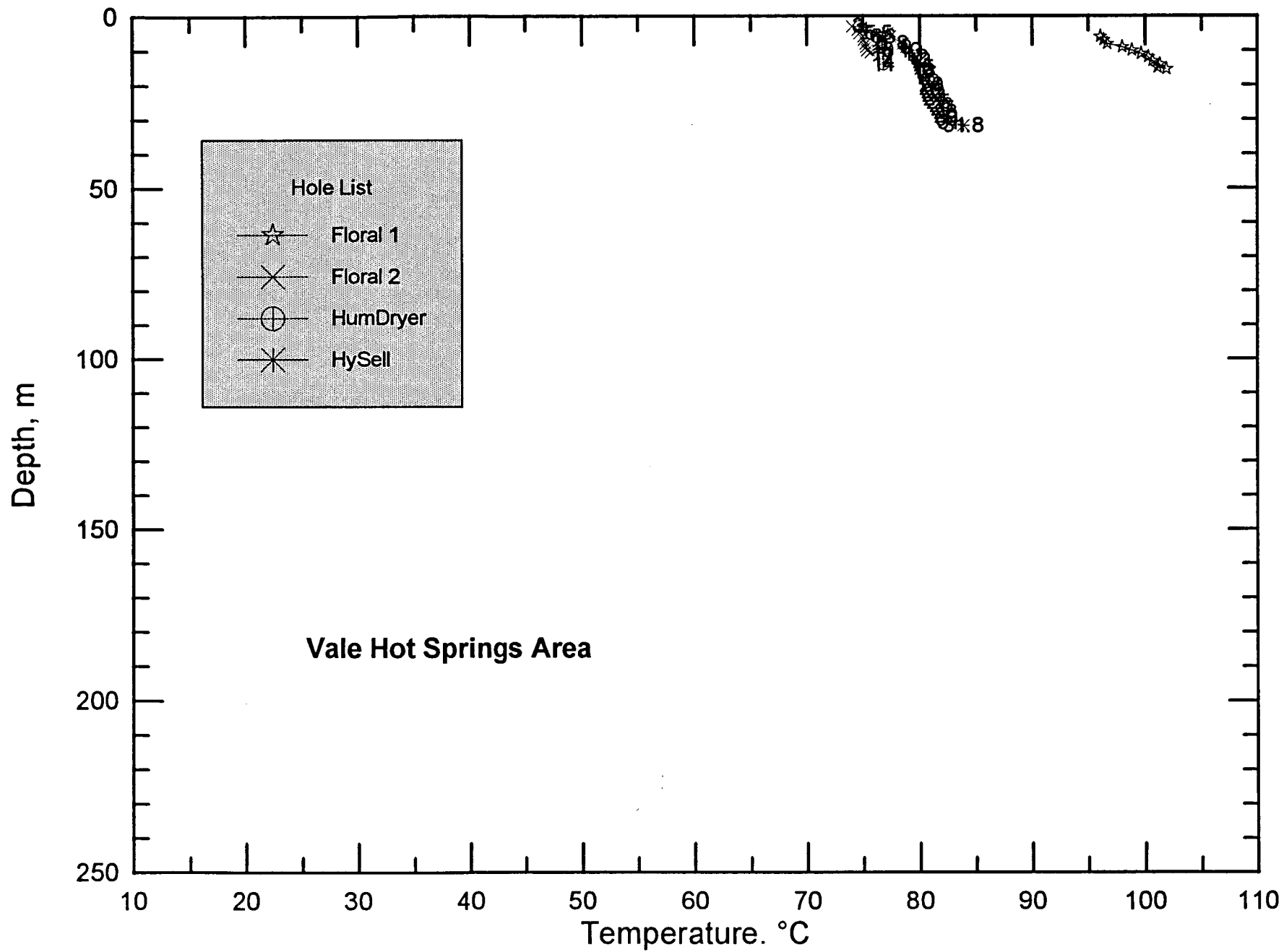
DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
2.0	6.6	74.140	165.45	0.0	0.0
3.0	9.8	74.600	166.28	460.0	25.2
4.0	13.1	75.090	167.16	490.0	26.9
5.0	16.4	75.670	168.21	580.0	31.8
6.0	19.7	76.210	169.18	540.0	29.6
7.0	23.0	76.450	169.61	240.0	13.2
8.0	26.2	76.650	169.97	200.0	11.0
9.0	29.5	76.680	170.02	30.0	1.6
10.0	32.8	76.700	170.06	20.0	1.1
11.0	36.1	76.730	170.11	30.0	1.6
12.0	39.4	76.730	170.11	0.0	0.0
14.0	45.9	76.760	170.17	15.0	0.8

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: HUMDRYER  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
3.0	9.8	75.840	168.51	0.0	0.0
4.0	13.1	76.550	169.79	710.0	39.0
5.0	16.4	77.110	170.80	560.0	30.7
6.0	19.7	77.390	171.30	280.0	15.4
8.0	26.2	78.530	173.35	570.0	31.3
9.0	29.5	78.820	173.88	290.0	15.9
10.0	32.8	79.180	174.52	360.0	19.8
11.0	36.1	79.510	175.12	330.0	18.1
12.0	39.4	79.790	175.62	280.0	15.4
13.0	42.7	80.020	176.04	230.0	12.6
14.0	45.9	80.090	176.16	70.0	3.8
15.0	49.2	80.270	176.49	180.0	9.9
16.0	52.5	80.340	176.61	70.0	3.8
17.0	55.8	80.430	176.77	90.0	4.9
18.0	59.1	80.460	176.83	30.0	1.6
19.0	62.3	80.740	177.33	280.0	15.4
20.0	65.6	81.080	177.94	340.0	18.7
21.0	68.9	81.060	177.91	-20.0	-1.1
22.0	72.2	81.220	178.20	160.0	8.8
23.0	75.5	81.330	178.39	110.0	6.0
24.0	78.7	81.450	178.61	120.0	6.6
25.0	82.0	81.700	179.06	250.0	13.7
26.0	85.3	81.940	179.49	240.0	13.2
27.0	88.6	82.060	179.71	120.0	6.6
28.0	91.9	82.330	180.19	270.0	14.8
29.0	95.1	82.370	180.27	40.0	2.2
30.0	98.4	82.430	180.37	60.0	3.3
31.0	101.7	82.600	180.68	170.0	9.3
31.8	104.3	83.890	183.00	1612.5	88.5

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: HYSELL  
DATE MEASURED: 1986

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
6.0	19.7	92.220	198.00	0.0	0.0
7.0	23.0	93.030	199.45	810.0	44.5
8.0	26.2	93.390	200.10	360.0	19.8
9.0	29.5	94.210	201.58	820.0	45.0
10.0	32.8	94.800	202.64	590.0	32.4
11.0	36.1	95.750	204.35	950.0	52.1
12.0	39.4	96.640	205.95	890.0	48.8
13.0	42.7	96.660	205.99	20.0	1.1
14.0	45.9	97.610	207.70	950.0	52.1
15.0	49.2	98.020	208.44	410.0	22.5
16.0	52.5	98.510	209.32	490.0	26.9
17.0	55.8	99.140	210.45	630.0	34.6
18.0	59.1	99.990	211.98	850.0	46.6
19.0	62.3	100.520	212.94	530.0	29.1
20.0	65.6	100.570	213.03	50.0	2.7
21.0	68.9	101.220	214.20	650.0	35.7
22.0	72.2	101.840	215.31	620.0	34.0
23.0	75.5	102.300	216.14	460.0	25.2
24.0	78.7	102.900	217.22	600.0	32.9
25.0	82.0	103.190	217.74	290.0	15.9
26.0	85.3	103.300	217.94	110.0	6.0
27.0	88.6	103.730	218.71	430.0	23.6
28.0	91.9	103.860	218.95	130.0	7.1
29.0	95.1	104.130	219.43	270.0	14.8
30.0	98.4	104.090	219.36	-40.0	-2.2
31.0	101.7	104.090	219.36	0.0	0.0
32.0	105.0	104.100	219.38	10.0	0.5
33.0	108.3	104.100	219.38	0.0	0.0
34.0	111.5	104.120	219.42	20.0	1.1
35.0	114.8	104.130	219.43	10.0	0.5
35.8	117.5	104.200	219.56	87.5	4.8



LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLER2  
DATE MEASURED: 1986

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
7.0	23.0	96.870	206.37	0.0	0.0
8.0	26.2	97.860	208.15	990.0	54.3
9.0	29.5	98.860	209.95	1000.0	54.9
10.0	32.8	99.460	211.03	600.0	32.9
11.0	36.1	100.410	212.74	950.0	52.1
12.0	39.4	101.340	214.41	930.0	51.0
13.0	42.7	102.250	216.05	910.0	49.9
14.0	45.9	103.210	217.78	960.0	52.7
15.0	49.2	103.870	218.97	660.0	36.2
16.0	52.5	104.540	220.17	670.0	36.8
17.0	55.8	104.560	220.21	20.0	1.1
18.0	59.1	104.590	220.26	30.0	1.6
19.0	62.3	104.650	220.37	60.0	3.3
20.0	65.6	104.740	220.53	90.0	4.9
21.0	68.9	104.870	220.77	130.0	7.1
22.0	72.2	104.960	220.93	90.0	4.9
23.0	75.5	105.270	221.49	310.0	17.0
24.0	78.7	105.450	221.81	180.0	9.9
25.0	82.0	105.700	222.26	250.0	13.7
26.0	85.3	105.950	222.71	250.0	13.7
27.0	88.6	106.260	223.27	310.0	17.0
28.0	91.9	106.570	223.83	310.0	17.0
29.0	95.1	106.730	224.11	160.0	8.8
30.0	98.4	107.020	224.64	290.0	15.9
31.0	101.7	107.400	225.32	380.0	20.9
32.0	105.0	107.570	225.63	170.0	9.3
33.0	108.3	107.570	225.63	0.0	0.0
34.0	111.5	108.000	226.40	430.0	23.6
35.0	114.8	108.130	226.63	130.0	7.1
36.0	118.1	108.210	226.78	80.0	4.4
37.0	121.4	108.320	226.98	110.0	6.0
38.0	124.7	108.500	227.30	180.0	9.9
39.0	128.0	108.550	227.39	50.0	2.7
40.0	131.2	108.620	227.52	70.0	3.8
41.0	134.5	108.670	227.61	50.0	2.7
41.4	135.8	109.350	228.83	1700.0	93.3



LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLER4  
DATE MEASURED: 5/7/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
6.0	19.7	98.290	208.92	0.0	0.0
7.0	23.0	98.830	209.89	540.0	29.6
8.0	26.2	100.650	213.17	1820.0	99.9
9.0	29.5	101.320	214.38	670.0	36.8
10.0	32.8	103.200	217.76	1880.0	103.2
11.0	36.1	104.510	220.12	1310.0	71.9
12.0	39.4	105.640	222.15	1130.0	62.0
13.0	42.7	106.730	224.11	1090.0	59.8
14.0	45.9	107.160	224.89	430.0	23.6
15.0	49.2	107.650	225.77	490.0	26.9
16.0	52.5	107.710	225.88	60.0	3.3
18.0	59.1	107.710	225.88	0.0	0.0
20.0	65.6	107.970	226.35	250.0	13.7
21.0	68.9	108.060	226.51	90.0	4.9
22.0	72.2	108.080	226.54	20.0	1.1
23.0	75.5	108.080	226.54	0.0	0.0
24.0	78.7	108.090	226.56	10.0	0.5
25.0	82.0	108.060	226.51	-30.0	-1.6
26.0	85.3	108.060	226.51	0.0	0.0
27.0	88.6	108.210	226.78	150.0	8.2
28.0	91.9	108.360	227.05	150.0	8.2
29.0	95.1	108.670	227.61	310.0	17.0
30.0	98.4	108.740	227.73	70.0	3.8
31.0	101.7	108.920	228.06	180.0	9.9
32.0	105.0	109.100	228.38	180.0	9.9
33.0	108.3	109.310	228.76	210.0	11.5
34.0	111.5	109.420	228.96	110.0	6.0
35.0	114.8	109.540	229.17	120.0	6.6
36.0	118.1	109.660	229.39	120.0	6.6
37.0	121.4	109.730	229.51	70.0	3.8
38.0	124.7	109.830	229.69	100.0	5.5
39.0	128.0	109.880	229.78	50.0	2.7
40.0	131.2	109.920	229.86	40.0	2.2
41.0	134.5	109.980	229.96	60.0	3.3
41.2	135.2	110.080	230.14	500.0	27.4

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLER3  
DATE MEASURED: 1986

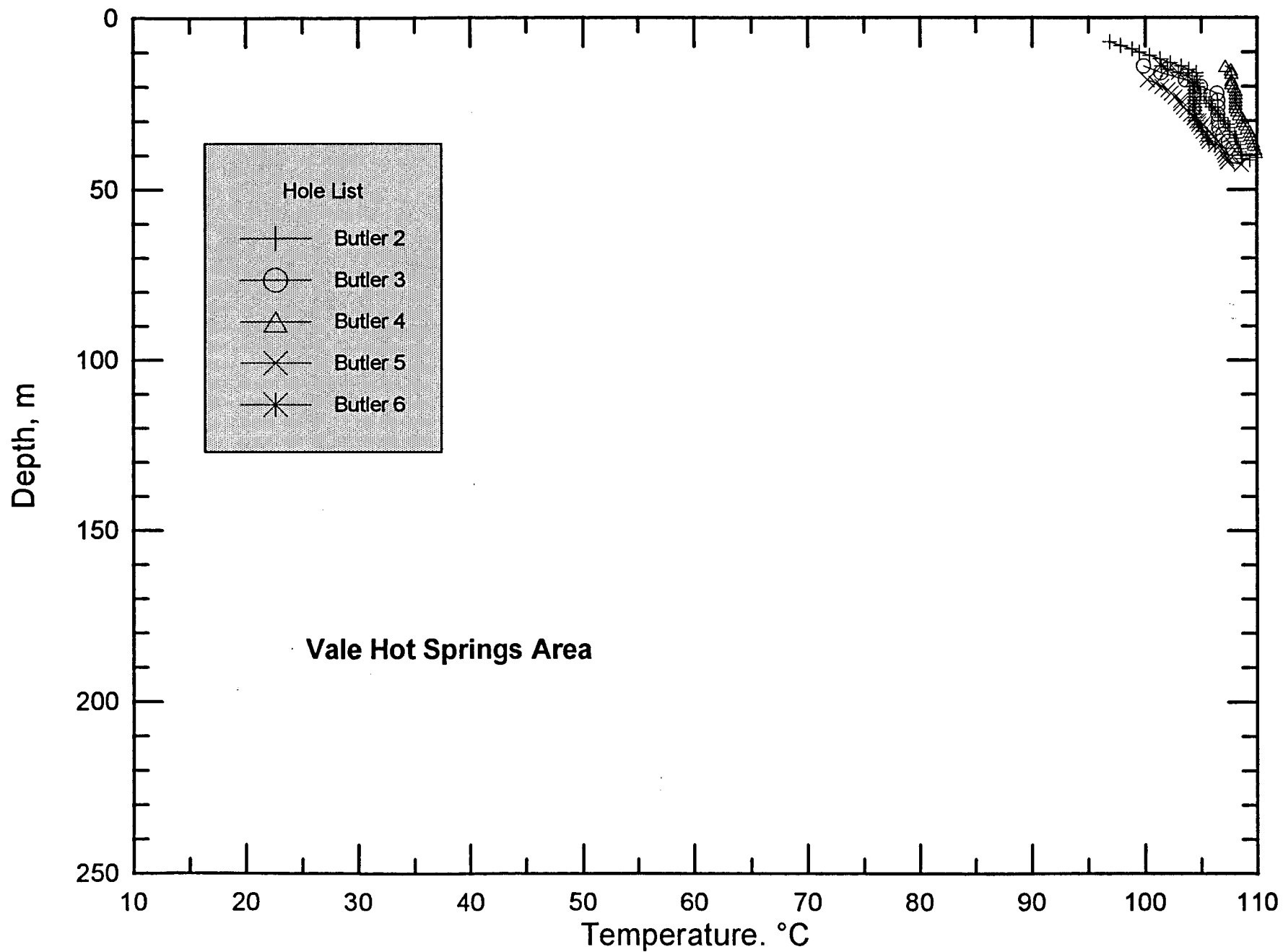
DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
14.0	45.9	99.850	211.73	0.0	0.0
16.0	52.5	101.400	214.52	775.0	42.5
18.0	59.1	103.580	218.44	1090.0	59.8
20.0	65.6	104.920	220.86	670.0	36.8
22.0	72.2	106.390	223.50	735.0	40.3
24.0	78.7	106.480	223.66	45.0	2.5
26.0	85.3	106.470	223.65	-5.0	-0.3
28.0	91.9	106.480	223.66	5.0	0.3
30.0	98.4	106.530	223.75	25.0	1.4
32.0	105.0	106.560	223.81	15.0	0.8
34.0	111.5	106.930	224.47	185.0	10.2
36.0	118.1	107.430	225.37	250.0	13.7
38.0	124.7	107.850	226.13	210.0	11.5
40.0	131.2	108.390	227.10	270.0	14.8
42.0	137.8	108.740	227.73	175.0	9.6
44.0	144.4	109.080	228.34	170.0	9.3
46.0	150.9	109.360	228.85	140.0	7.7
48.0	157.5	109.530	229.15	85.0	4.7
50.0	164.0	109.670	229.41	70.0	3.8
52.0	170.6	109.880	229.78	105.0	5.8
53.0	173.9	109.910	229.84	30.0	1.6

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLER5  
DATE MEASURED: 5/1/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
14.0	45.9	97.260	207.07	0.0	0.0
15.0	49.2	97.890	208.20	630.0	34.6
16.0	52.5	98.480	209.26	590.0	32.4
17.0	55.8	99.300	210.74	820.0	45.0
18.0	59.1	100.180	212.32	880.0	48.3
19.0	62.3	100.960	213.73	780.0	42.8
20.0	65.6	101.500	214.70	540.0	29.6
21.0	68.9	102.050	215.69	550.0	30.2
22.0	72.2	102.330	216.19	280.0	15.4
23.0	75.5	102.690	216.84	360.0	19.8
24.0	78.7	103.160	217.69	470.0	25.8
25.0	82.0	103.180	217.72	20.0	1.1
26.0	85.3	103.420	218.16	240.0	13.2
27.0	88.6	103.680	218.62	260.0	14.3
28.0	91.9	104.040	219.27	360.0	19.8
29.0	95.1	104.350	219.83	310.0	17.0
30.0	98.4	104.790	220.62	440.0	24.1
31.0	101.7	105.140	221.25	350.0	19.2
32.0	105.0	105.490	221.88	350.0	19.2
33.0	108.3	105.770	222.39	280.0	15.4
34.0	111.5	105.970	222.75	200.0	11.0
35.0	114.8	106.240	223.23	270.0	14.8
36.0	118.1	106.480	223.66	240.0	13.2
37.0	121.4	106.750	224.15	270.0	14.8
38.0	124.7	106.870	224.37	120.0	6.6
39.0	128.0	107.060	224.71	190.0	10.4
40.0	131.2	107.160	224.89	100.0	5.5
41.0	134.5	107.290	225.12	130.0	7.1
42.0	137.8	107.360	225.25	70.0	3.8
42.7	140.1	108.580	227.44	1742.9	95.6

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DCD  
HOLE NAME: BUTLER6  
DATE MEASURED: 5/1/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
12.0	39.4	99.340	210.81	0.0	0.0
13.0	42.7	100.350	212.63	1010.0	55.4
14.0	45.9	101.440	214.59	1090.0	59.8
15.0	49.2	101.980	215.56	540.0	29.6
16.0	52.5	102.950	217.31	970.0	53.2
17.0	55.8	103.780	218.80	830.0	45.6
18.0	59.1	104.190	219.54	410.0	22.5
19.0	62.3	104.390	219.90	200.0	11.0
20.0	65.6	104.430	219.97	40.0	2.2
21.0	68.9	104.430	219.97	0.0	0.0
22.0	72.2	104.440	219.99	10.0	0.5
23.0	75.5	104.420	219.96	-20.0	-1.1
24.0	78.7	104.410	219.94	-10.0	-0.5
25.0	82.0	104.410	219.94	0.0	0.0
26.0	85.3	104.400	219.92	-10.0	-0.5
27.0	88.6	104.400	219.92	0.0	0.0
28.0	91.9	104.410	219.94	10.0	0.5
29.0	95.1	104.440	219.99	30.0	1.6
30.0	98.4	104.600	220.28	160.0	8.8
31.0	101.7	104.770	220.59	170.0	9.3
32.0	105.0	104.990	220.98	220.0	12.1
33.0	108.3	105.150	221.27	160.0	8.8
34.0	111.5	105.470	221.85	320.0	17.6
35.0	114.8	105.560	222.01	90.0	4.9
36.0	118.1	105.680	222.22	120.0	6.6
37.0	121.4	106.250	223.25	570.0	31.3



LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDC  
HOLE NAME: OTM-5  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
10.0	32.8	87.010	188.62	0.0	0.0
15.0	49.2	88.570	191.43	312.0	17.1
20.0	65.6	90.330	194.59	352.0	19.3
25.0	82.0	87.800	190.04	-506.0	-27.8
30.0	98.4	88.450	191.21	130.0	7.1
35.0	114.8	89.610	193.30	232.0	12.7
40.0	131.2	92.740	198.93	626.0	34.4
45.0	147.6	95.500	203.90	552.0	30.3
50.0	164.0	97.630	207.73	426.0	23.4
55.0	180.4	98.800	209.84	234.0	12.8
60.0	196.9	99.340	210.81	108.0	5.9
65.0	213.3	99.550	211.19	42.0	2.3
70.0	229.7	99.430	210.97	-24.0	-1.3
75.0	246.1	99.210	210.58	-44.0	-2.4

LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDB  
HOLE NAME: OTM-1  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
5.0	16.4	70.980	159.76	0.0	0.0
10.0	32.8	74.820	166.68	768.0	42.1
15.0	49.2	78.320	172.98	700.0	38.4
20.0	65.6	80.900	177.62	516.0	28.3
25.0	82.0	82.160	179.89	252.0	13.8
30.0	98.4	84.010	183.22	370.0	20.3
35.0	114.8	85.610	186.10	320.0	17.6
40.0	131.2	87.160	188.89	310.0	17.0
45.0	147.6	88.010	190.42	170.0	9.3
50.0	164.0	88.490	191.28	96.0	5.3
55.0	180.4	88.810	191.86	64.0	3.5
60.0	196.9	89.170	192.51	72.0	4.0
65.0	213.3	89.540	193.17	74.0	4.1
70.0	229.7	90.020	194.04	96.0	5.3
75.0	246.1	90.400	194.72	76.0	4.2
80.0	262.5	90.960	195.73	112.0	6.1
85.0	278.9	91.460	196.63	100.0	5.5
90.0	295.3	92.020	197.64	112.0	6.1
95.0	311.7	92.660	198.79	128.0	7.0
100.0	328.1	93.260	199.87	120.0	6.6
105.0	344.5	93.830	200.89	114.0	6.3
110.0	360.9	94.470	202.05	128.0	7.0
115.0	377.3	95.110	203.20	128.0	7.0
120.0	393.7	95.660	204.19	110.0	6.0
125.0	410.1	96.220	205.20	112.0	6.1
130.0	426.5	96.490	205.68	54.0	3.0
135.0	442.9	97.020	206.64	106.0	5.8
140.0	459.3	97.530	207.55	102.0	5.6
145.0	475.7	97.950	208.31	84.0	4.6
150.0	492.1	98.230	208.81	56.0	3.1
155.0	508.5	98.700	209.66	94.0	5.2
160.0	524.9	99.140	210.45	88.0	4.8
165.0	541.3	99.540	211.17	80.0	4.4
170.0	557.7	99.810	211.66	54.0	3.0
175.0	574.1	100.010	212.02	40.0	2.2
180.0	590.6	100.150	212.27	28.0	1.5
185.0	607.0	100.230	212.41	16.0	0.9
190.0	623.4	100.480	212.86	50.0	2.7
195.0	639.8	100.600	213.08	24.0	1.3

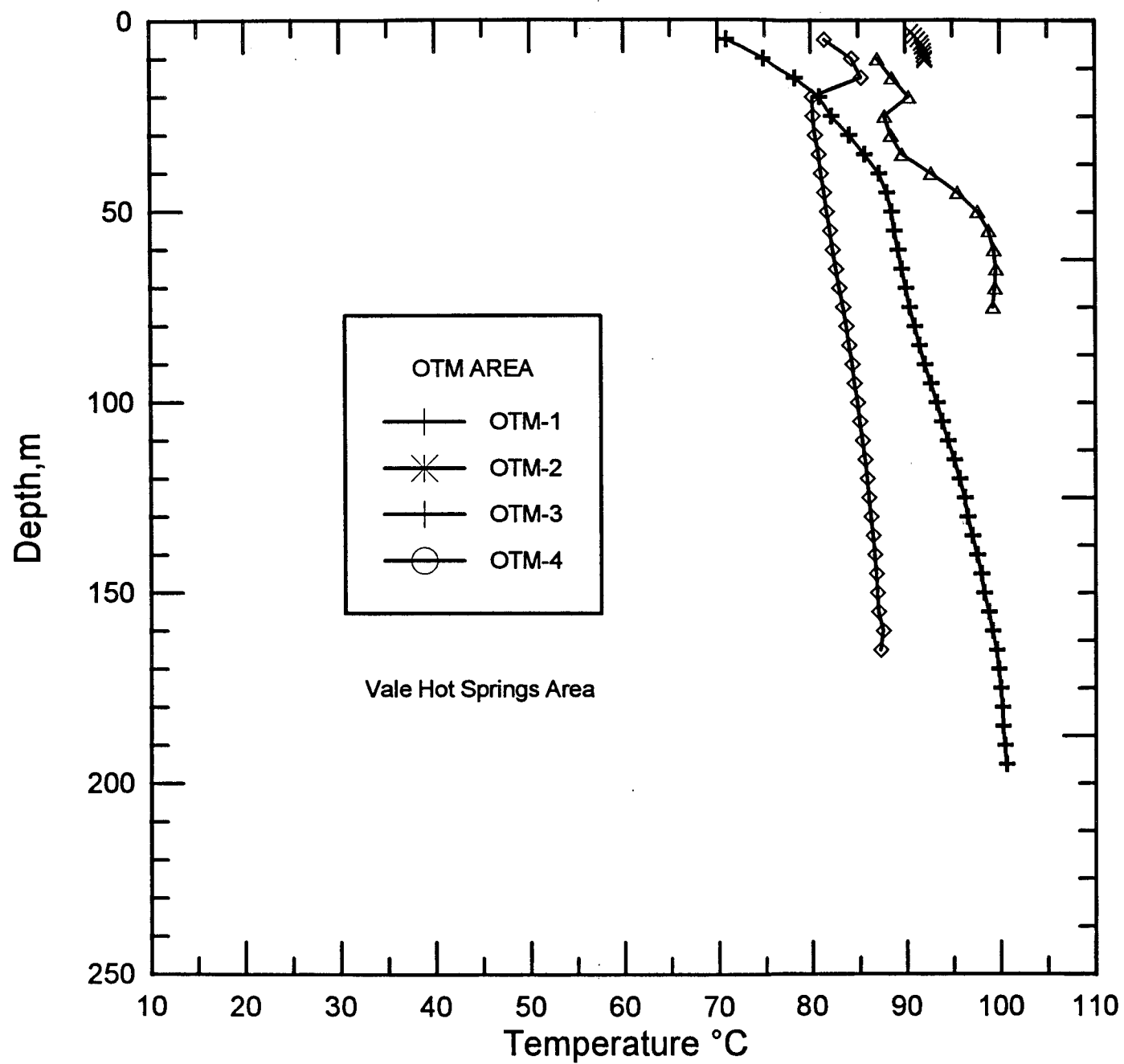
LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDDB  
HOLE NAME: OTM-2  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
5.0	16.4	81.450	178.61	0.0	0.0
10.0	32.8	84.310	183.76	572.0	31.4
15.0	49.2	85.290	185.52	196.0	10.8
20.0	65.6	80.190	176.34	-1020.0	-56.0
25.0	82.0	80.210	176.38	4.0	0.2
30.0	98.4	80.450	176.81	48.0	2.6
35.0	114.8	80.830	177.49	76.0	4.2
40.0	131.2	81.070	177.93	48.0	2.6
45.0	147.6	81.410	178.54	68.0	3.7
50.0	164.0	81.660	178.99	50.0	2.7
55.0	180.4	82.000	179.60	68.0	3.7
60.0	196.9	82.280	180.10	56.0	3.1
65.0	213.3	82.630	180.73	70.0	3.8
70.0	229.7	82.950	181.31	64.0	3.5
75.0	246.1	83.340	182.01	78.0	4.3
80.0	262.5	83.660	182.59	64.0	3.5
85.0	278.9	83.970	183.15	62.0	3.4
90.0	295.3	84.260	183.67	58.0	3.2
95.0	311.7	84.530	184.15	54.0	3.0
100.0	328.1	84.840	184.71	62.0	3.4
105.0	344.5	85.070	185.13	46.0	2.5
110.0	360.9	85.360	185.65	58.0	3.2
115.0	377.3	85.620	186.12	52.0	2.9
120.0	393.7	85.830	186.49	42.0	2.3
125.0	410.1	86.020	186.84	38.0	2.1
130.0	426.5	86.240	187.23	44.0	2.4
135.0	442.9	86.450	187.61	42.0	2.3
140.0	459.3	86.640	187.95	38.0	2.1
145.0	475.7	86.780	188.20	28.0	1.5
150.0	492.1	86.910	188.44	26.0	1.4
155.0	508.5	87.030	188.65	24.0	1.3
160.0	524.9	87.500	189.50	94.0	5.2
165.0	541.3	87.200	188.96	-60.0	-3.3

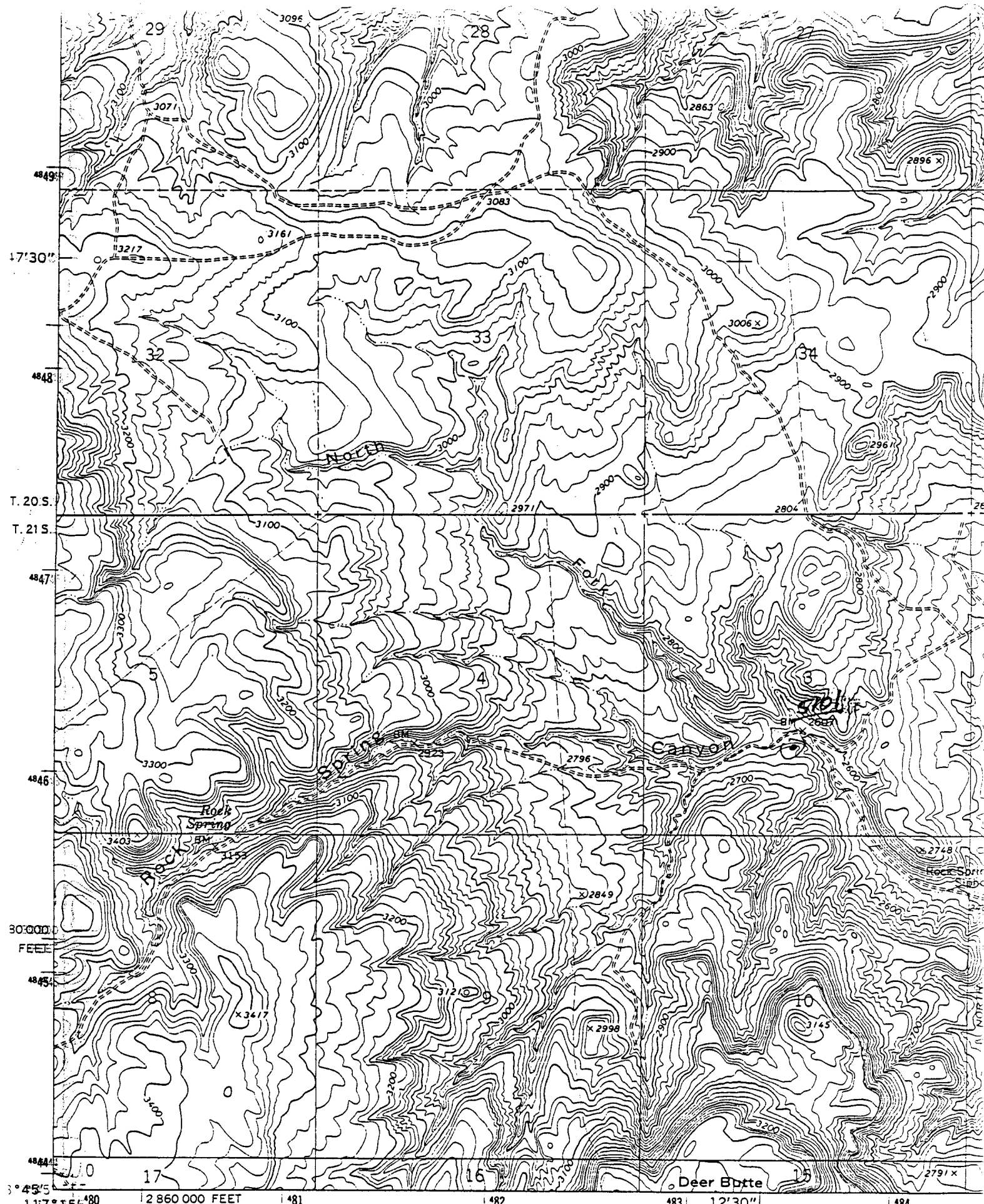


LOCATION: BOISE AMS, ORE  
T/R-S: 18S/45E-20DDC  
HOLE NAME: OTM-4  
DATE MEASURED: 10/16/86

DEPTH METERS	DEPTH FEET	TEMPERATURE		GEOTHERMAL GRADIENT	
		DEG C	DEG F	DEG C/KM	DEG F/100 FT
3.0	9.8	90.600	195.08	0.0	0.0
4.0	13.1	91.030	195.85	430.0	23.6
5.0	16.4	91.360	196.45	330.0	18.1
6.0	19.7	91.690	197.04	330.0	18.1
7.0	23.0	91.800	197.24	110.0	6.0
8.0	26.2	91.940	197.49	140.0	7.7
9.0	29.5	92.010	197.62	70.0	3.8
10.0	32.8	92.040	197.67	30.0	1.6
10.4	34.1	92.040	197.67	0.0	0.0



## ***HUNT WELL LOGS***



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 Topography by photogrammetric methods from aerial  
 photographs taken 1966-67. Field checked 1967.

5101  
 117°12.375'  
 43°46.175'

GN \*  
 MN

1000 0 1000  
 1 5

-56-

LOCATION: BOISE AMS, OREGON  
T/R-S: 21S45E-3CCA  
HOLE NAME: 81-5101  
DATE MEASURED: 7/14/81

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	18.200	0.0
6.1	16.589	-528.6
9.1	15.422	-382.8
12.2	15.761	111.2
15.2	16.339	189.6
18.3	16.911	187.7
21.3	17.678	251.5
24.4	18.339	216.9
27.4	19.028	226.0
30.5	19.778	246.1
33.5	20.478	229.7
36.6	21.172	227.8
39.6	21.789	202.3
42.7	22.328	176.8
45.7	22.722	129.4
48.8	23.272	180.4
51.8	23.672	131.2
54.9	24.089	136.7
57.9	24.522	142.2
61.0	24.878	116.7
64.0	25.239	118.5
67.1	25.600	118.5
70.1	25.939	111.2
73.2	26.378	144.0
76.2	26.928	180.4
79.2	27.278	114.8
82.3	27.689	134.9
85.3	28.011	105.7
88.4	28.472	151.3
91.4	28.900	140.3
94.5	29.278	123.9
97.5	29.600	105.7
100.6	30.022	138.5
103.6	30.472	147.6
106.7	30.828	116.7
109.7	31.139	102.1
112.8	31.528	127.6
115.8	31.839	102.1
118.9	32.172	109.4
121.9	32.761	193.2
125.0	33.172	134.9

LOCATION: BOISE AMS, OREGON

PAGE 2

T/R-S: 21S45E-3CCA

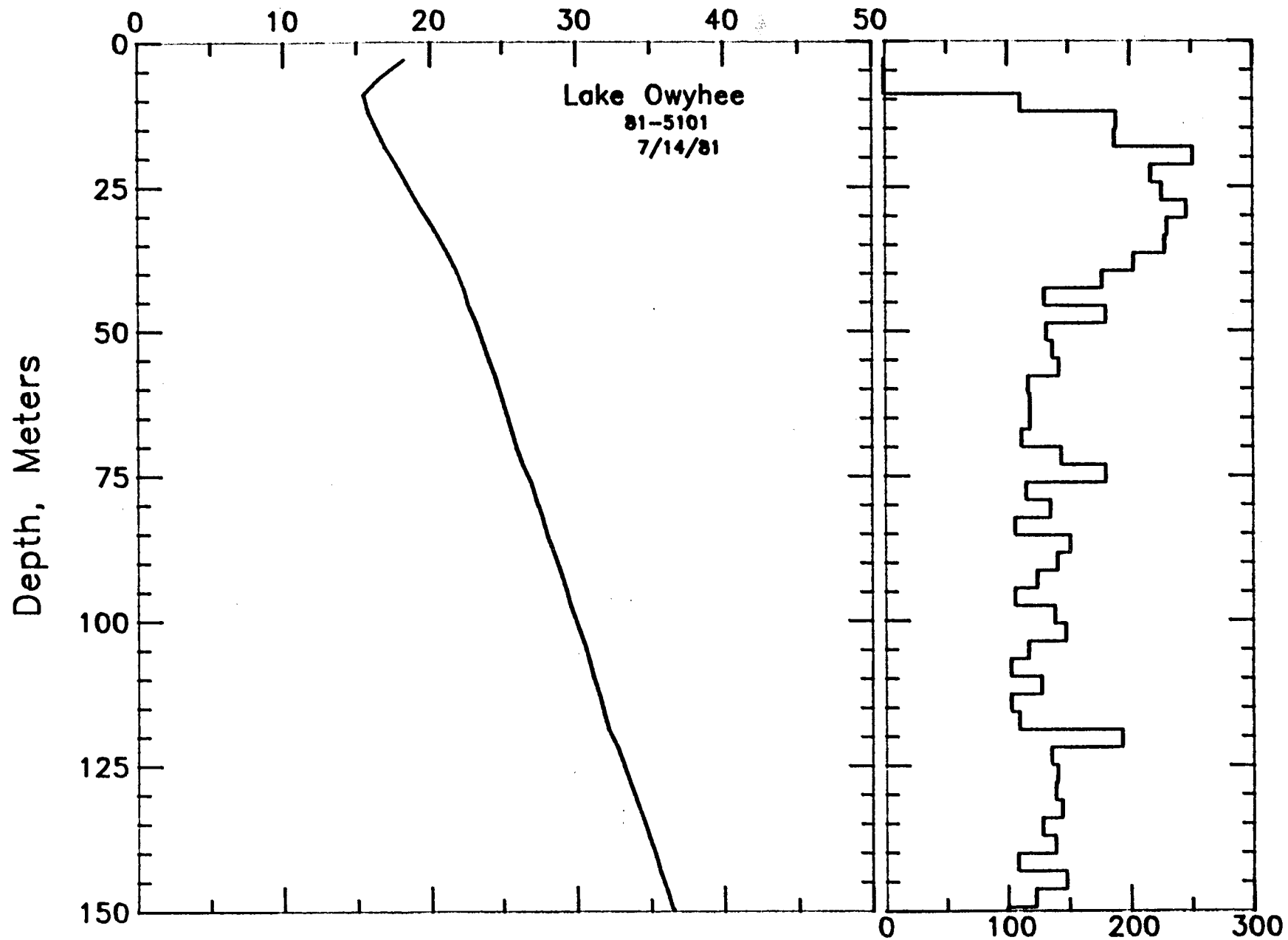
HOLE NAME: 81-5101

DATE MEASURED: 7/14/81

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	33.600	140.3
131.1	34.022	138.5
134.1	34.461	144.0
137.2	34.850	127.6
140.2	35.272	138.5
143.3	35.600	107.5
146.3	36.050	147.6
149.4	36.422	122.1
150.9	36.572	98.4

Temperature, Deg C

Grad., Deg C/Km



TEMPERATURE, DEG C

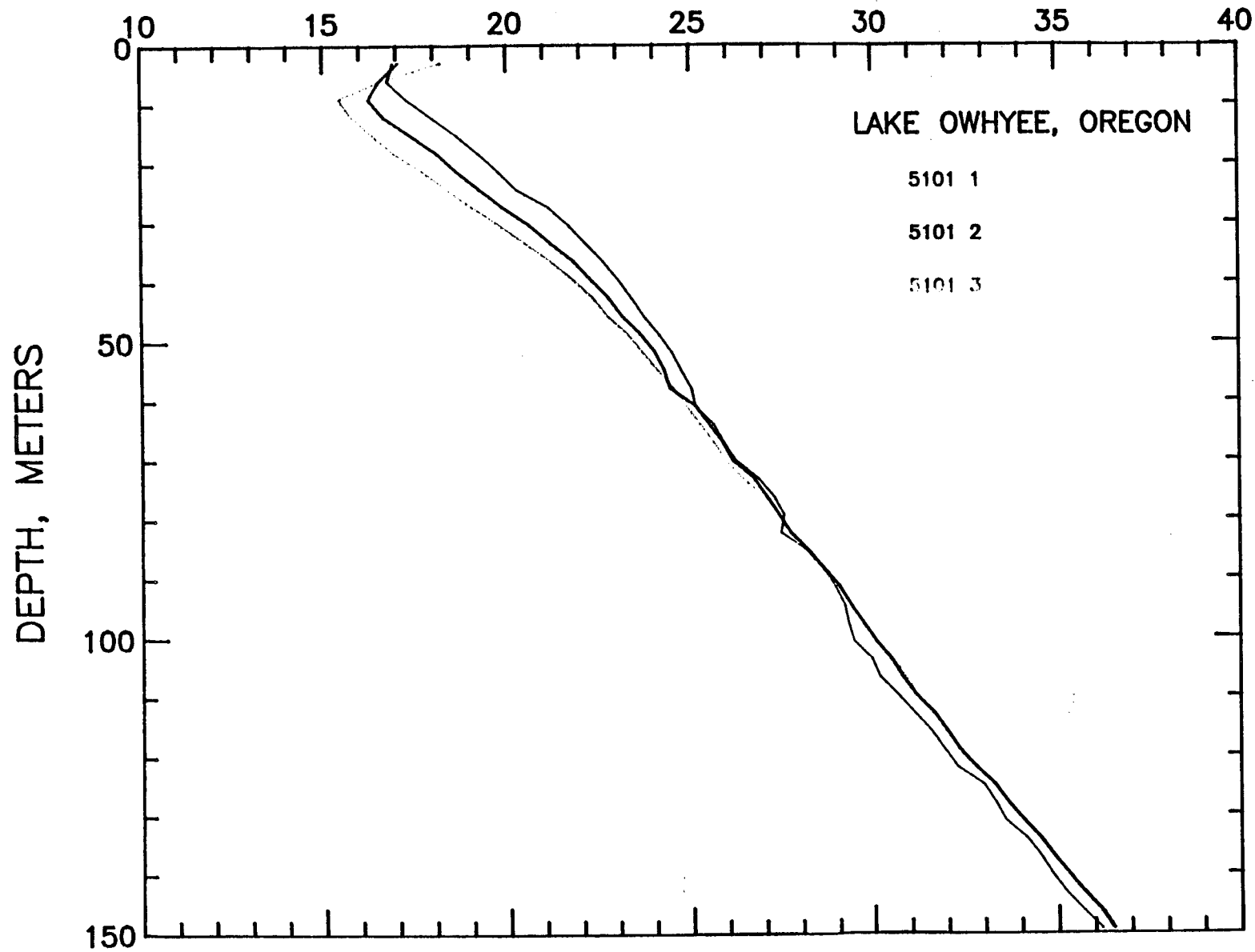




TABLE MTN.)

481000m.E.

482

483 12'30"

4843000m.N.

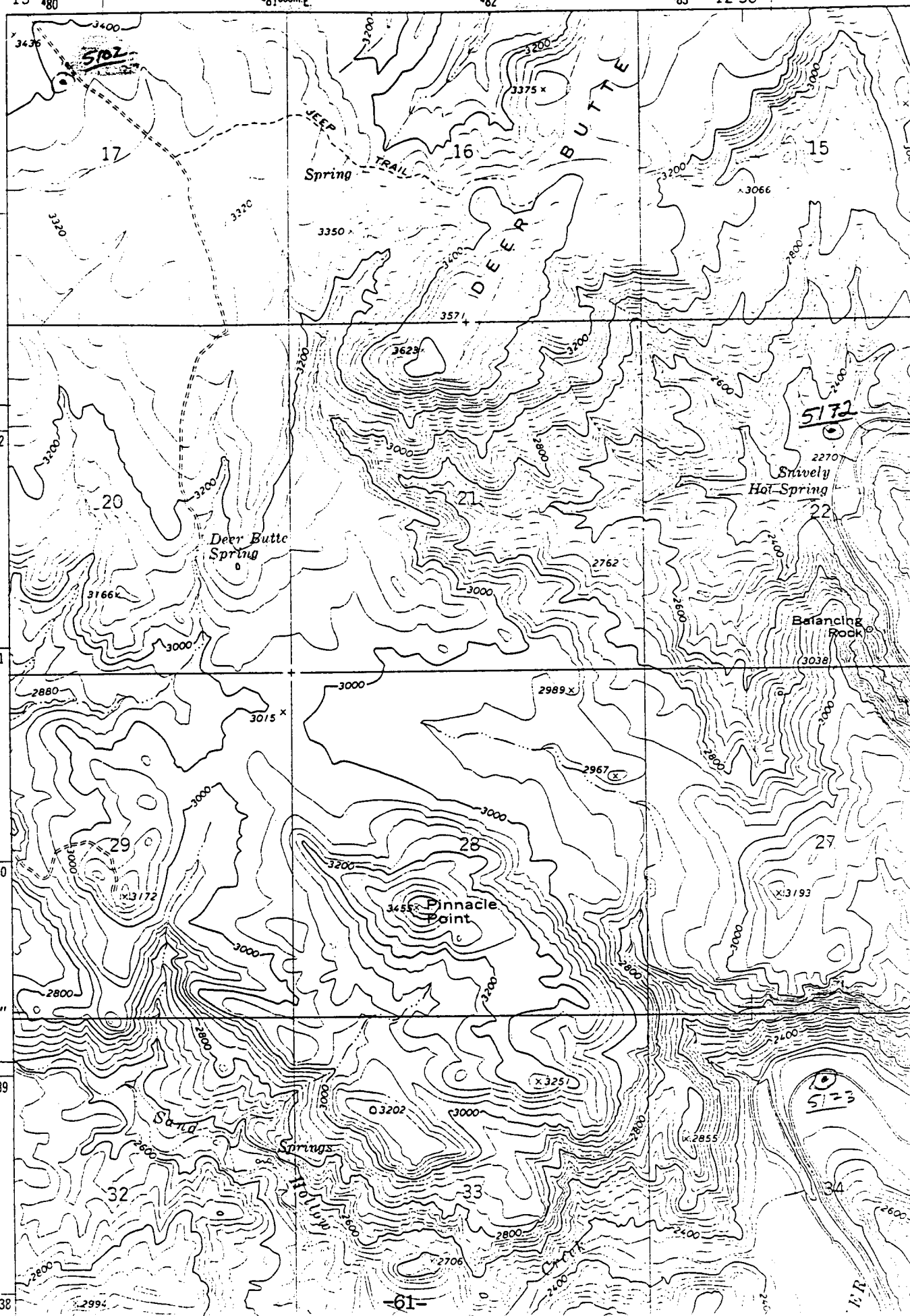
 $3^{\circ} 44.825'$ 

42'30"

4839

4838

-61-



LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-17BDC  
HOLE NAME: 81-5102  
DATE MEASURED: 7/16/81

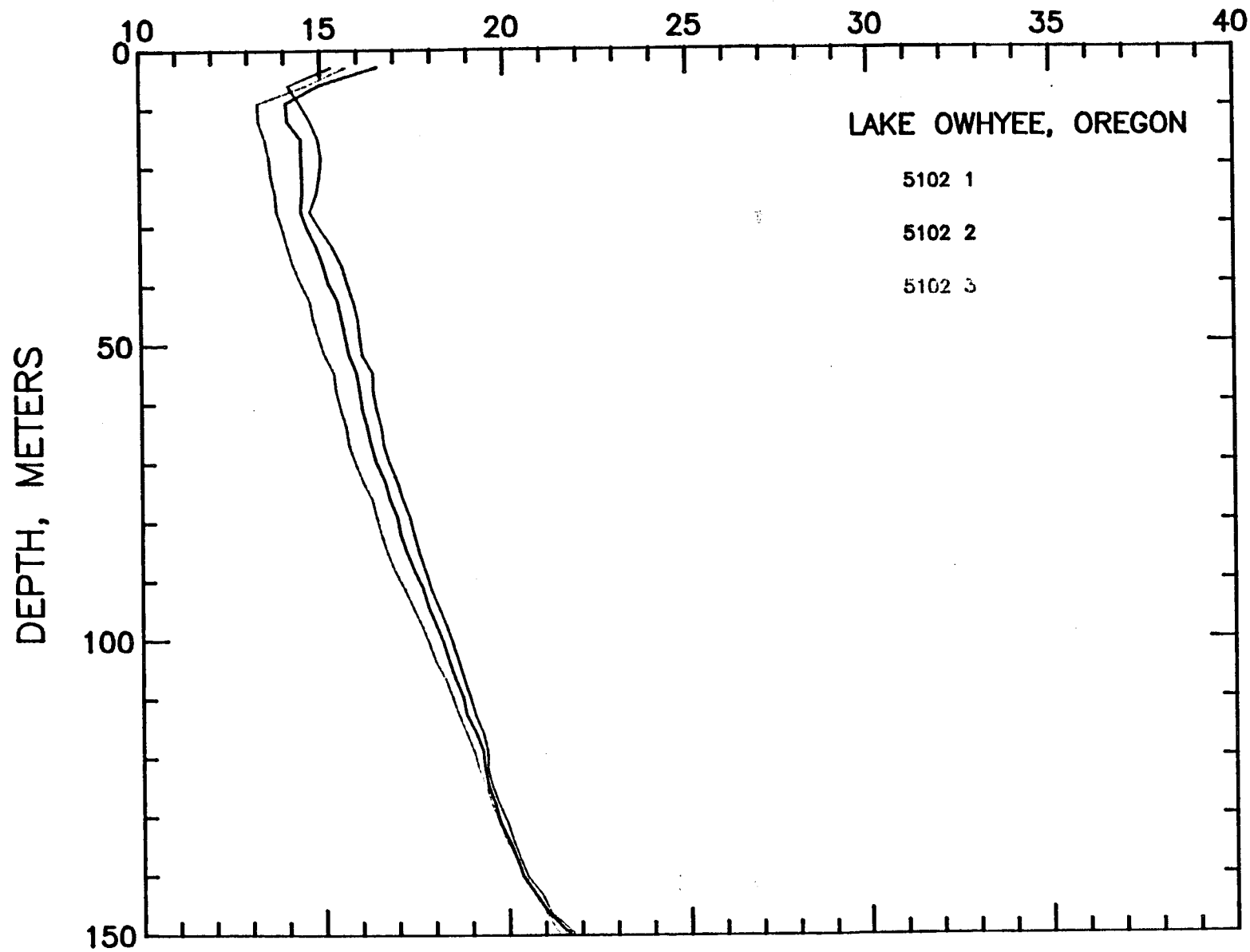
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	15.700	0.0
6.1	14.639	-348.1
9.1	13.272	-448.4
12.2	13.300	9.1
15.2	13.472	56.5
18.3	13.578	34.6
21.3	13.622	14.6
24.4	13.739	38.3
27.4	13.778	12.8
30.5	13.939	52.9
33.5	14.072	43.7
36.6	14.222	49.2
39.6	14.428	67.4
42.7	14.672	80.2
45.7	14.761	29.2
48.8	14.911	49.2
51.8	15.072	52.9
54.9	15.322	82.0
57.9	15.378	18.2
61.0	15.500	40.1
64.0	15.650	49.2
67.1	15.722	23.7
70.1	15.900	58.3
73.2	16.100	65.6
76.2	16.350	82.0
79.2	16.472	40.1
82.3	16.600	41.9
85.3	16.761	52.9
88.4	16.961	65.6
91.4	17.211	82.0
94.5	17.439	74.7
97.5	17.672	76.6
100.6	17.872	65.6
103.6	18.050	58.3
106.7	18.322	89.3
109.7	18.500	58.3
112.8	18.672	56.5
115.8	18.872	65.6
118.9	19.072	65.6
121.9	19.211	45.6
125.0	19.400	62.0

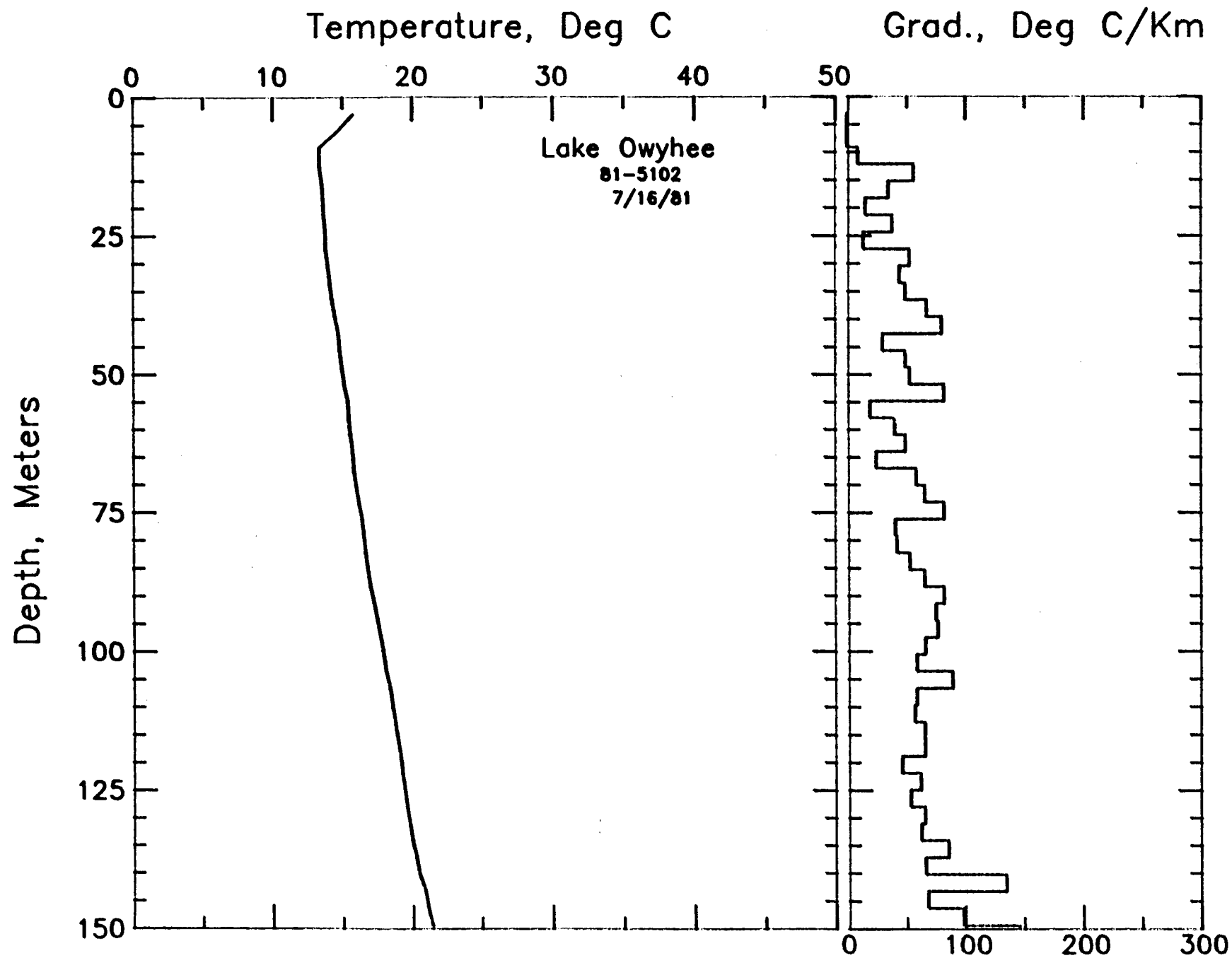
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-17BDC  
HOLE NAME: 81-5102  
DATE MEASURED: 7/16/81

PAGE 2

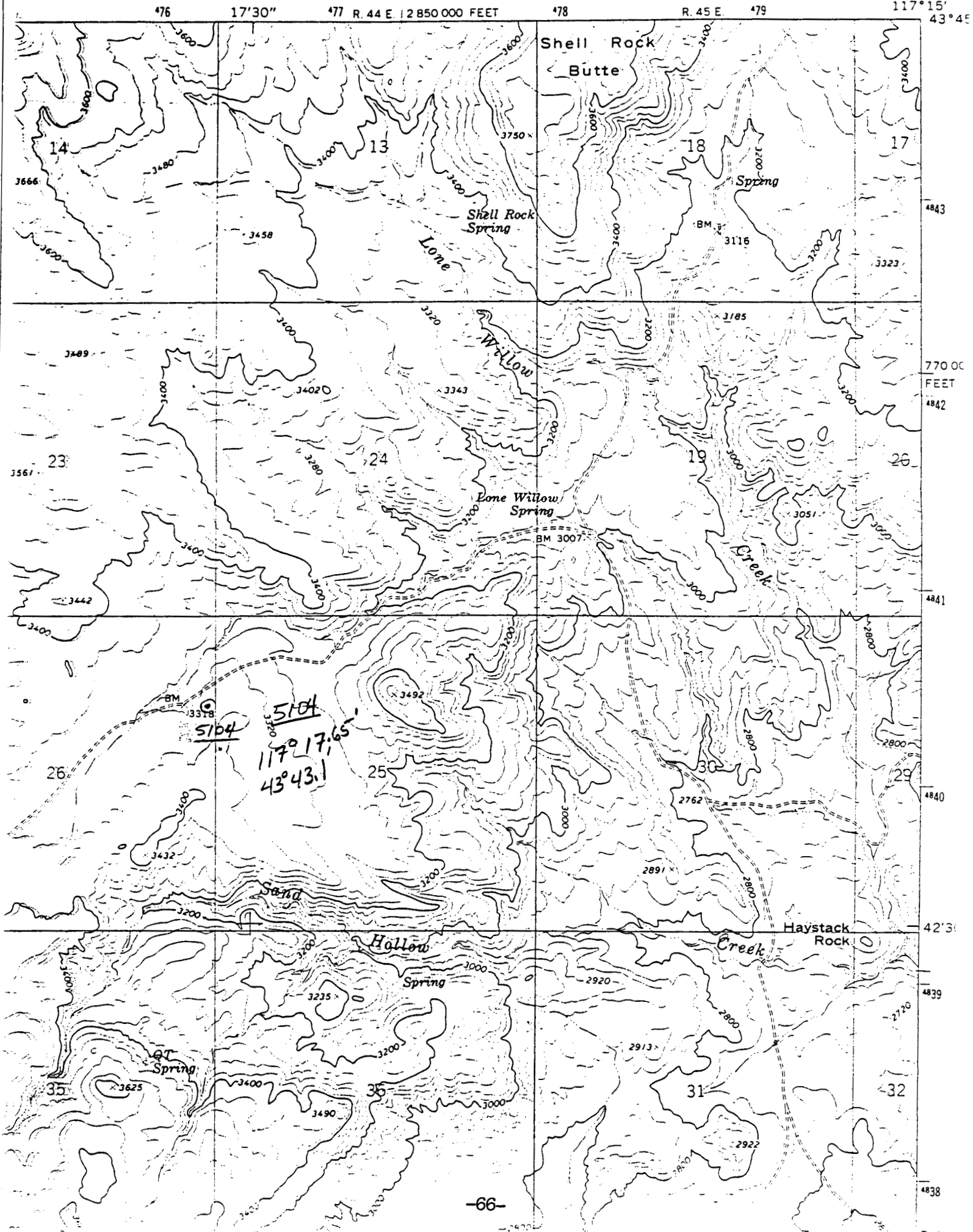
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	19.561	52.9
131.1	19.761	65.6
134.1	19.950	62.0
137.2	20.211	85.7
140.2	20.411	65.6
143.3	20.822	134.9
146.3	21.028	67.4
149.4	21.328	98.4
149.7	21.372	145.8

TEMPERATURE, DEG C





7.5 MINUTE SERIES (TOPOGRAPHIC)



LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/44E-26AAD  
HOLE NAME: 81-5104  
DATE MEASURED: 7/17/81

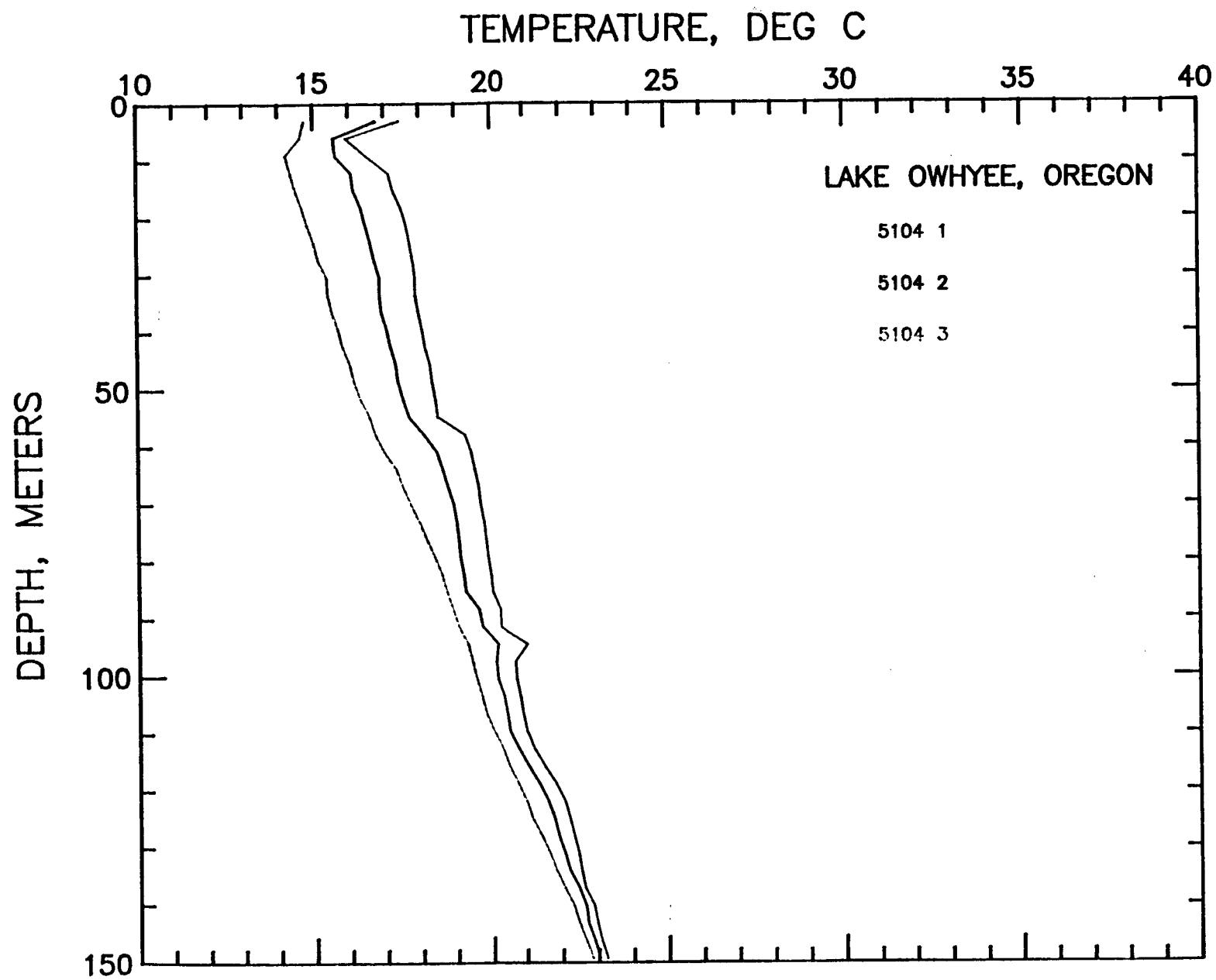
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	14.750	0.0
6.1	14.628	-40.1
9.1	14.222	-133.1
12.2	14.361	45.6
15.2	14.500	45.6
18.3	14.678	58.3
21.3	14.828	49.2
24.4	15.011	60.1
27.4	15.139	41.9
30.5	15.378	78.4
33.5	15.411	10.9
36.6	15.528	38.3
39.6	15.700	56.5
42.7	15.822	40.1
45.7	16.022	65.6
48.8	16.139	38.3
51.8	16.322	60.1
54.9	16.578	83.8
57.9	16.739	52.9
61.0	16.989	82.0
64.0	17.322	109.4
67.1	17.511	62.0
70.1	17.739	74.7
73.2	17.972	76.6
76.2	18.172	65.6
79.2	18.389	71.1
82.3	18.589	65.6
85.3	18.728	45.6
88.4	18.900	56.5
91.4	19.072	56.5
94.5	19.322	82.0
97.5	19.439	38.3
100.6	19.550	36.5
103.6	19.700	49.2
106.7	19.828	41.9
109.7	20.050	72.9
112.8	20.328	91.1
115.8	20.539	69.3
118.9	20.789	82.0
121.9	21.011	72.9
125.0	21.172	52.9

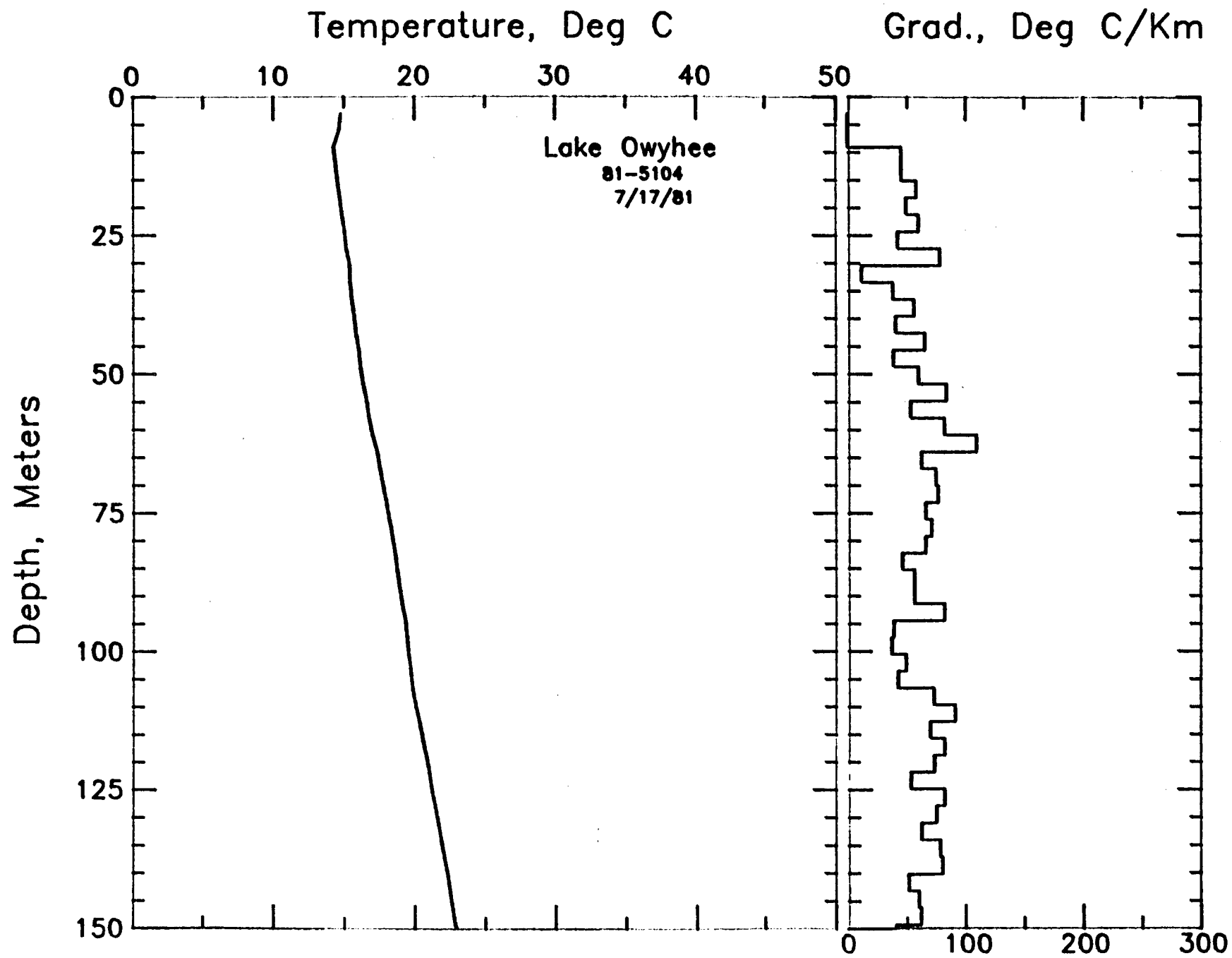
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/44E-26AAD  
HOLE NAME: 81-5104  
DATE MEASURED: 7/17/81

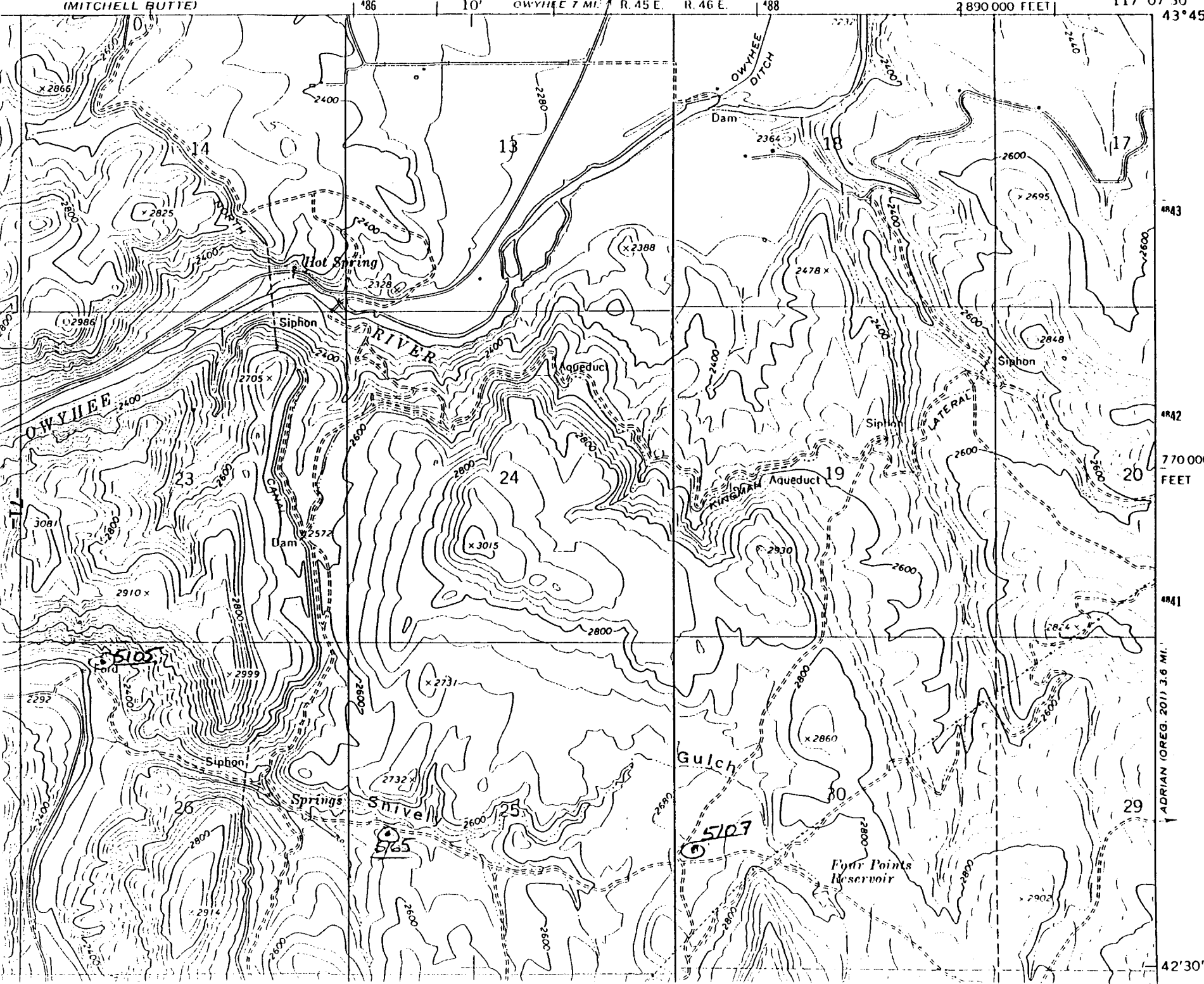
PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	21.422	82.0
131.1	21.650	74.7
134.1	21.839	62.0
137.2	22.078	78.4
140.2	22.322	80.2
143.3	22.478	51.0
146.3	22.661	60.1
149.4	22.850	62.0
152.4	22.972	40.1









5105  
117° 11.35'  
43° 43.3'

42'30"

LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-26BBA  
HOLE NAME: 81-5105  
DATE MEASURED: 8/10/81

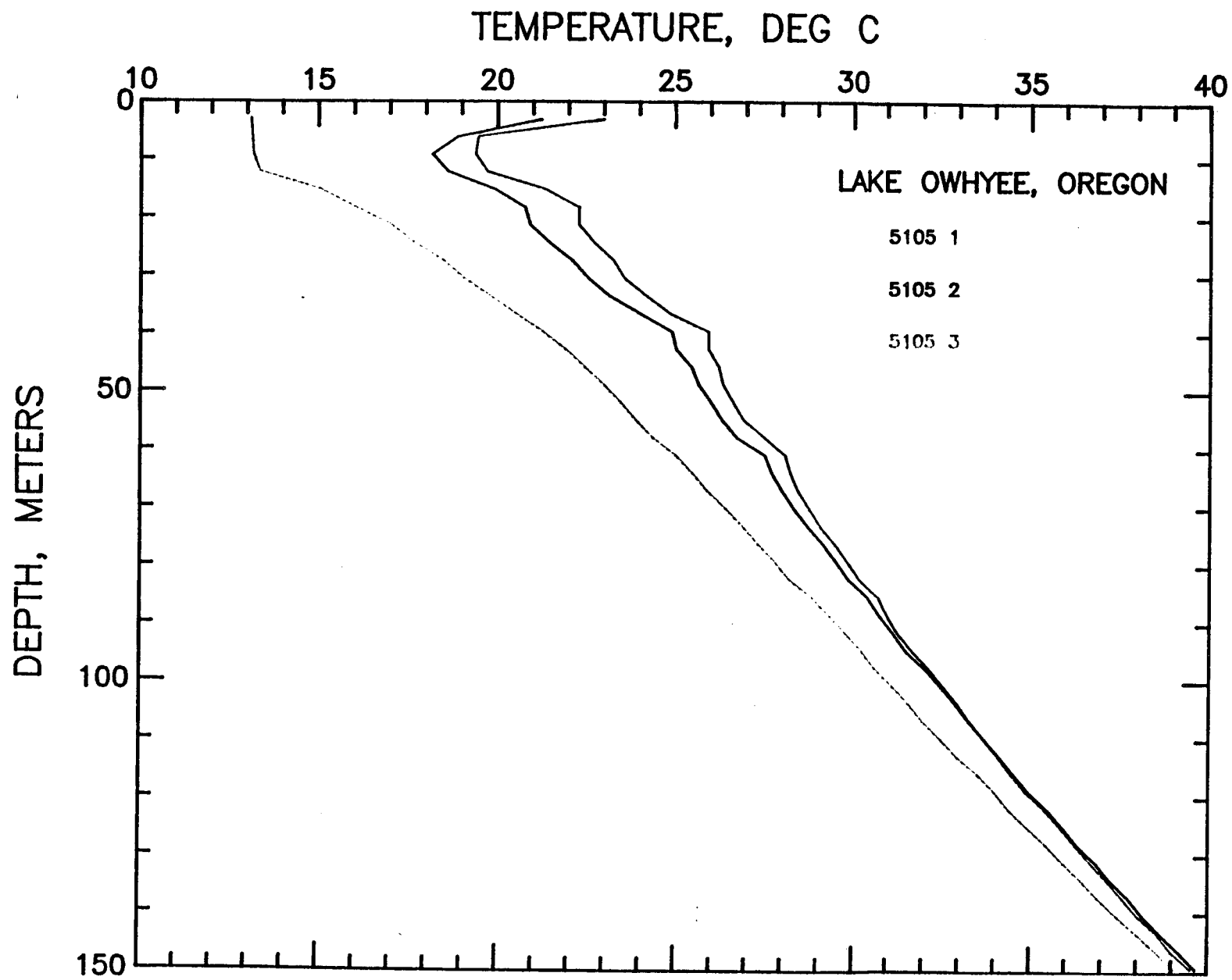
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	13.100	0.0
6.1	13.139	12.8
9.1	13.172	10.9
12.2	13.350	58.3
15.2	15.039	554.1
18.3	16.000	315.3
21.3	17.022	335.4
24.4	17.661	209.6
27.4	18.472	266.1
30.5	19.050	189.6
33.5	19.789	242.4
36.6	20.511	236.9
39.6	21.272	249.7
42.7	21.928	215.1
45.7	22.450	171.3
48.8	23.000	180.4
51.8	23.472	154.9
54.9	23.900	140.3
57.9	24.372	154.9
61.0	25.022	213.3
64.0	25.489	153.1
67.1	25.900	134.9
70.1	26.428	173.2
73.2	26.900	154.9
76.2	27.311	134.9
79.2	27.800	160.4
82.3	28.200	131.2
85.3	28.822	204.1
88.4	29.311	160.4
91.4	29.761	147.6
94.5	30.228	153.1
97.5	30.650	138.5
100.6	31.150	164.0
103.6	31.600	147.6
106.7	32.000	131.2
109.7	32.500	164.0
112.8	32.961	151.3
115.8	33.539	189.6
118.9	34.022	158.6
121.9	34.428	133.1
125.0	34.928	164.0

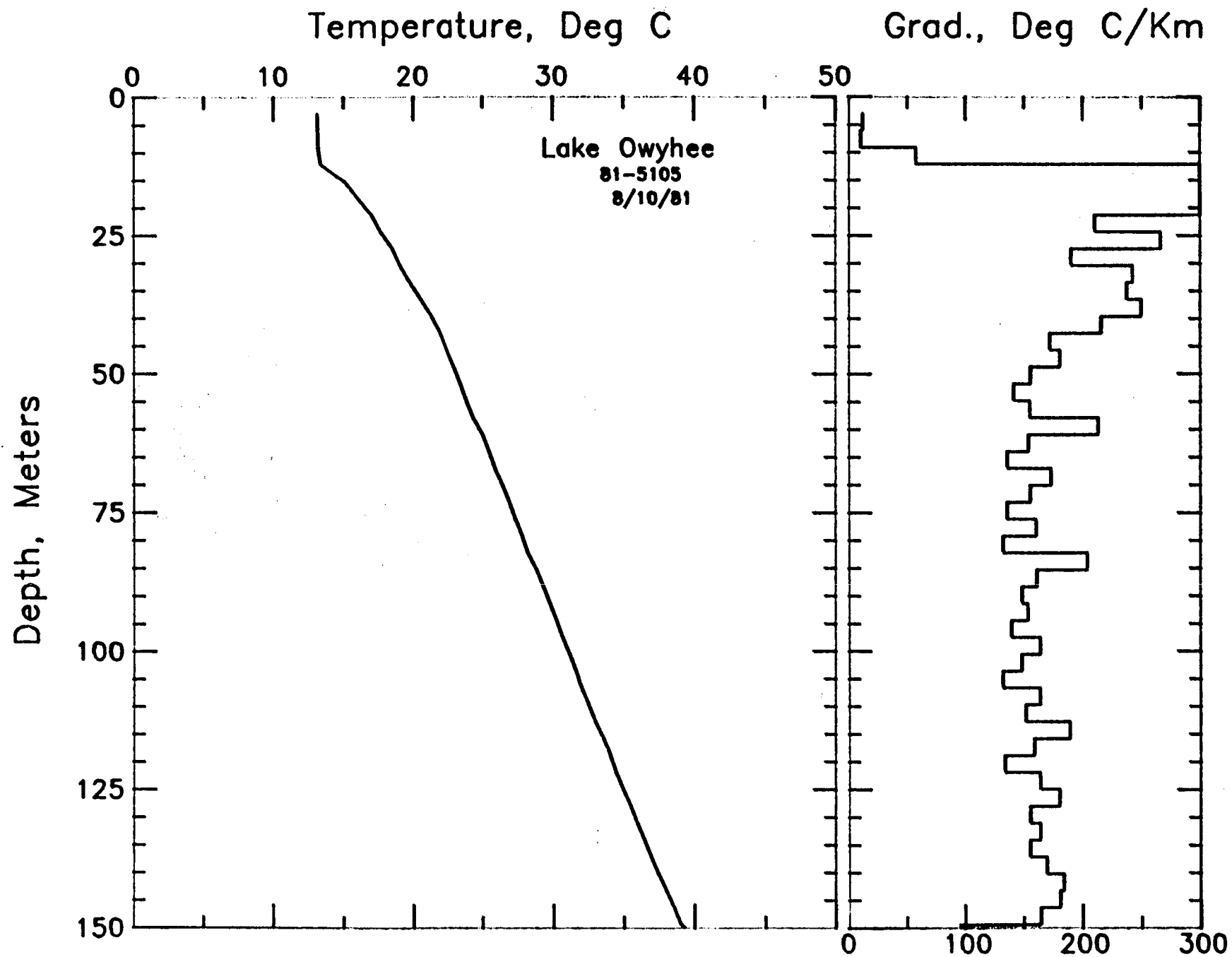
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-26BBA  
HOLE NAME: 81-5105  
DATE MEASURED: 8/10/81

PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	35.478	180.4
131.1	35.950	154.9
134.1	36.450	164.0
137.2	36.922	154.9
140.2	37.439	169.5
143.3	38.000	184.1
146.3	38.550	180.4
149.4	39.050	164.0
152.4	39.339	94.8

-74-





2311 SW  
MITCHELL BUTTE

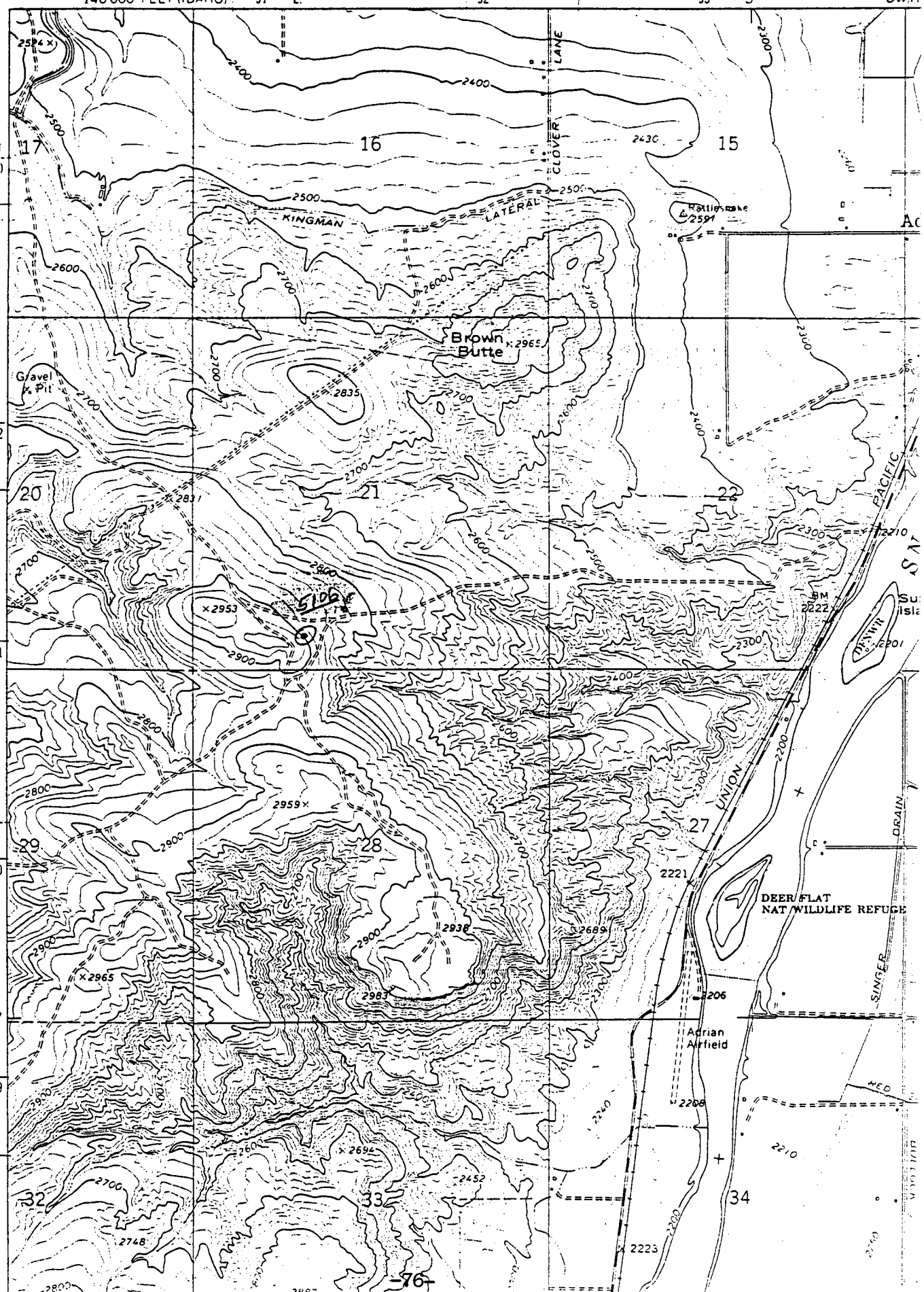
UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

NYSSA (U.S. 20 6  
OWY)

117°07'30" 140 000 FEET (IDAHO) 491000m E. 492 493 5'

760 000 FEET  
(IDAHO)  
4843000m N.

5106  
3°43.45  
17°6.525





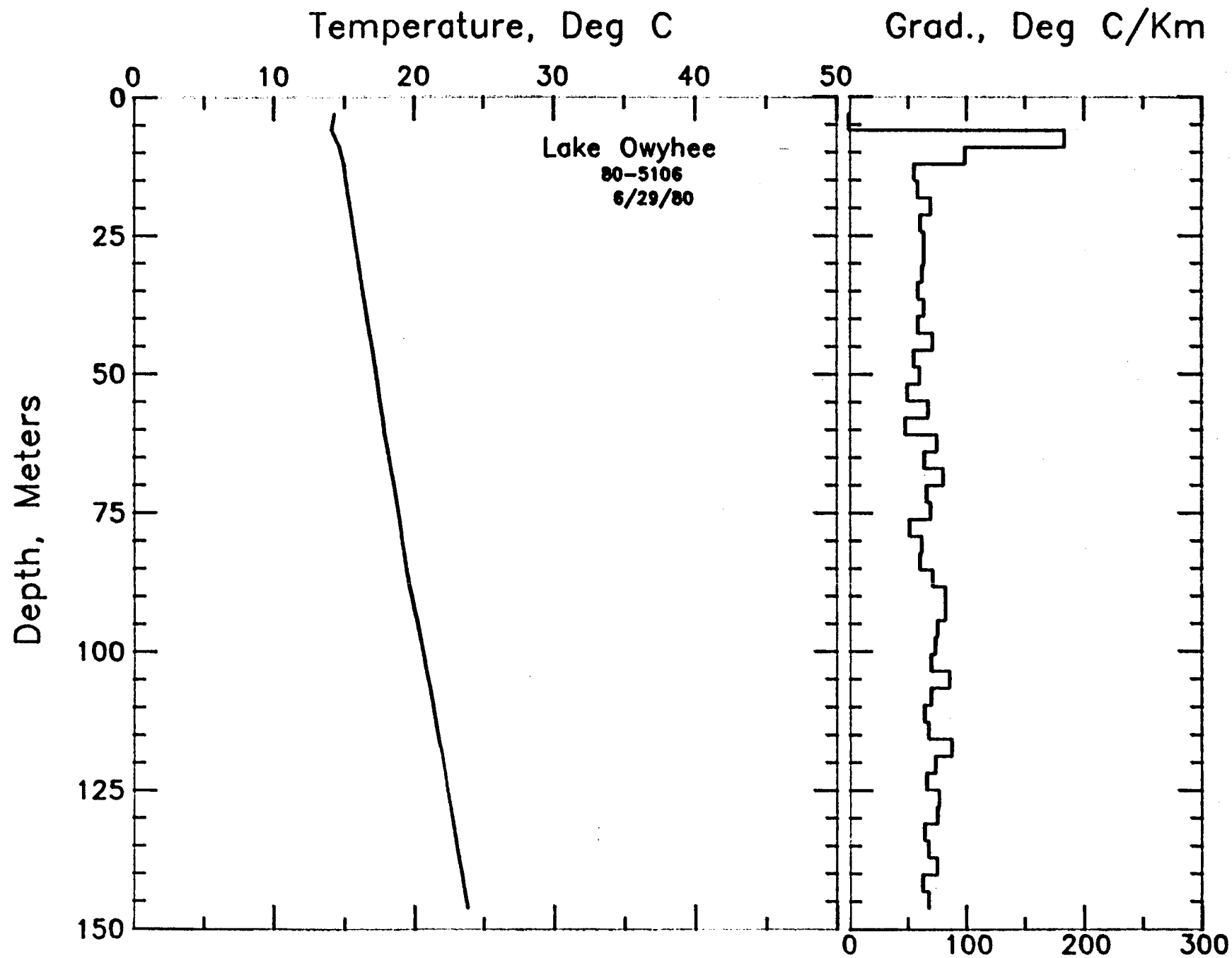
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/46E-21CDC  
HOLE NAME: 80-5106  
DATE MEASURED: 6/29/80

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	14.261	0.0
6.1	14.067	-63.8
9.1	14.628	184.1
12.2	14.928	98.4
15.2	15.094	54.7
18.3	15.272	58.3
21.3	15.483	69.3
24.4	15.667	60.1
27.4	15.861	63.8
30.5	16.056	63.8
33.5	16.244	62.0
36.6	16.422	58.3
39.6	16.617	63.8
42.7	16.794	58.3
45.7	17.011	71.1
48.8	17.178	54.7
51.8	17.361	60.1
54.9	17.511	49.2
57.9	17.717	67.4
61.0	17.861	47.4
64.0	18.089	74.7
67.1	18.283	63.8
70.1	18.528	80.2
73.2	18.728	65.6
76.2	18.939	69.3
79.2	19.094	51.0
82.3	19.283	62.0
85.3	19.467	60.1
88.4	19.683	71.1
91.4	19.933	82.0
94.5	20.183	82.0
97.5	20.411	74.7
100.6	20.633	72.9
103.6	20.844	69.3
106.7	21.106	85.7
109.7	21.317	69.3
112.8	21.511	63.8
115.8	21.717	67.4
118.9	21.983	87.5
121.9	22.206	72.9
125.0	22.406	65.6

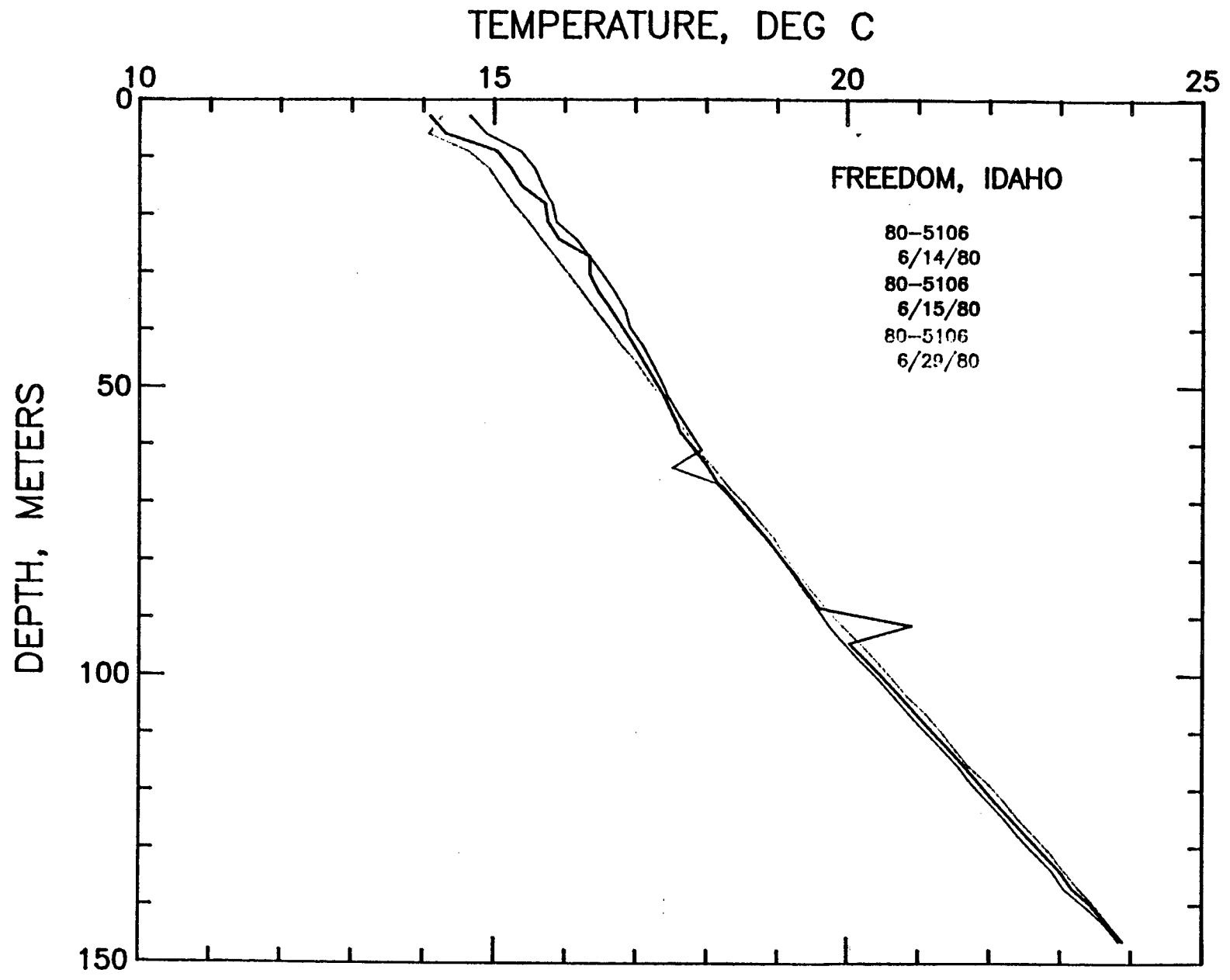
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/46E-21CDC  
HOLE NAME: 80-5106  
DATE MEASURED: 6/29/80

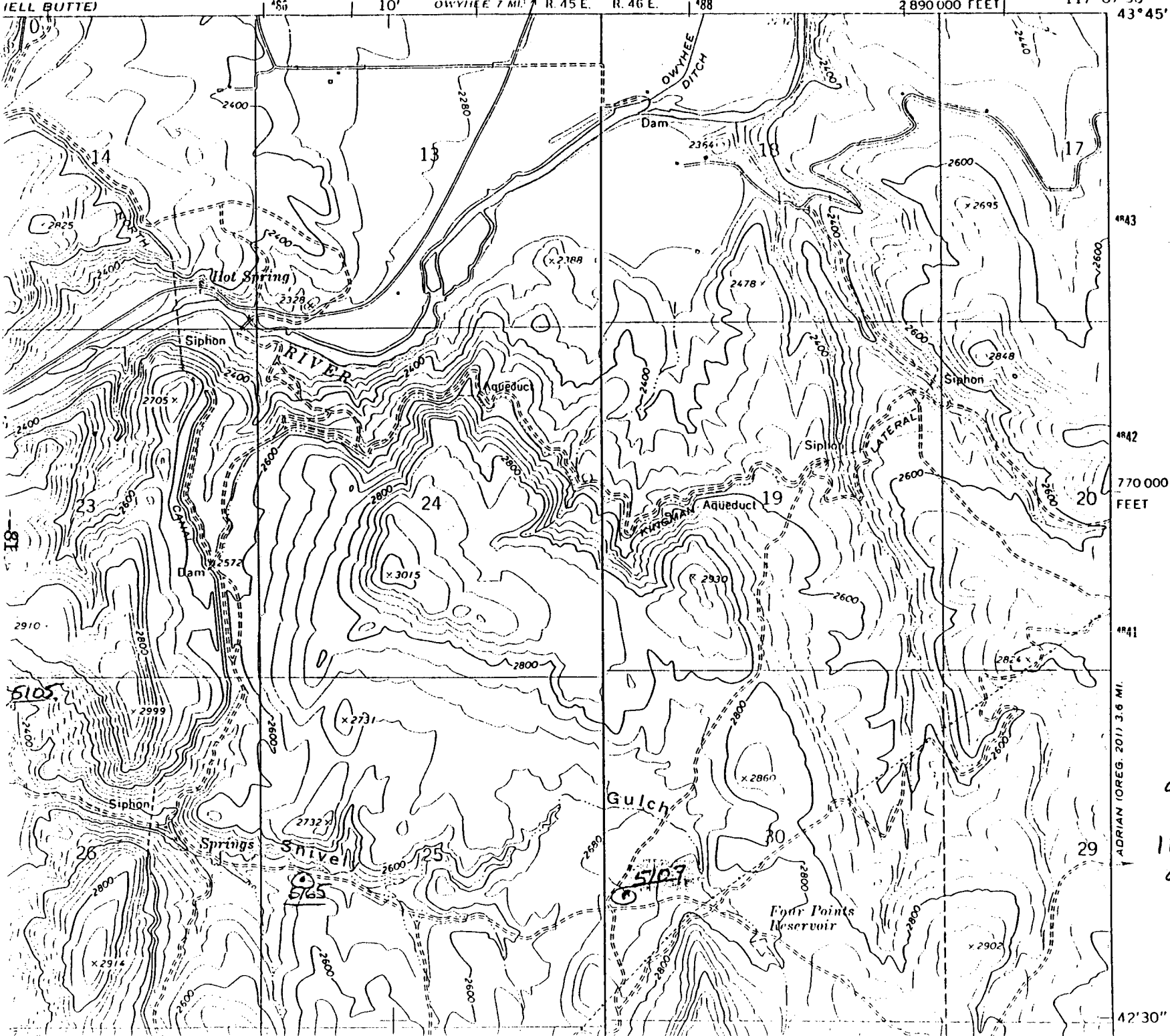
PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	22.639	76.6
131.1	22.867	74.7
134.1	23.061	63.8
137.2	23.267	67.4
140.2	23.494	74.7
143.3	23.683	62.0
146.3	23.889	67.4



-08-



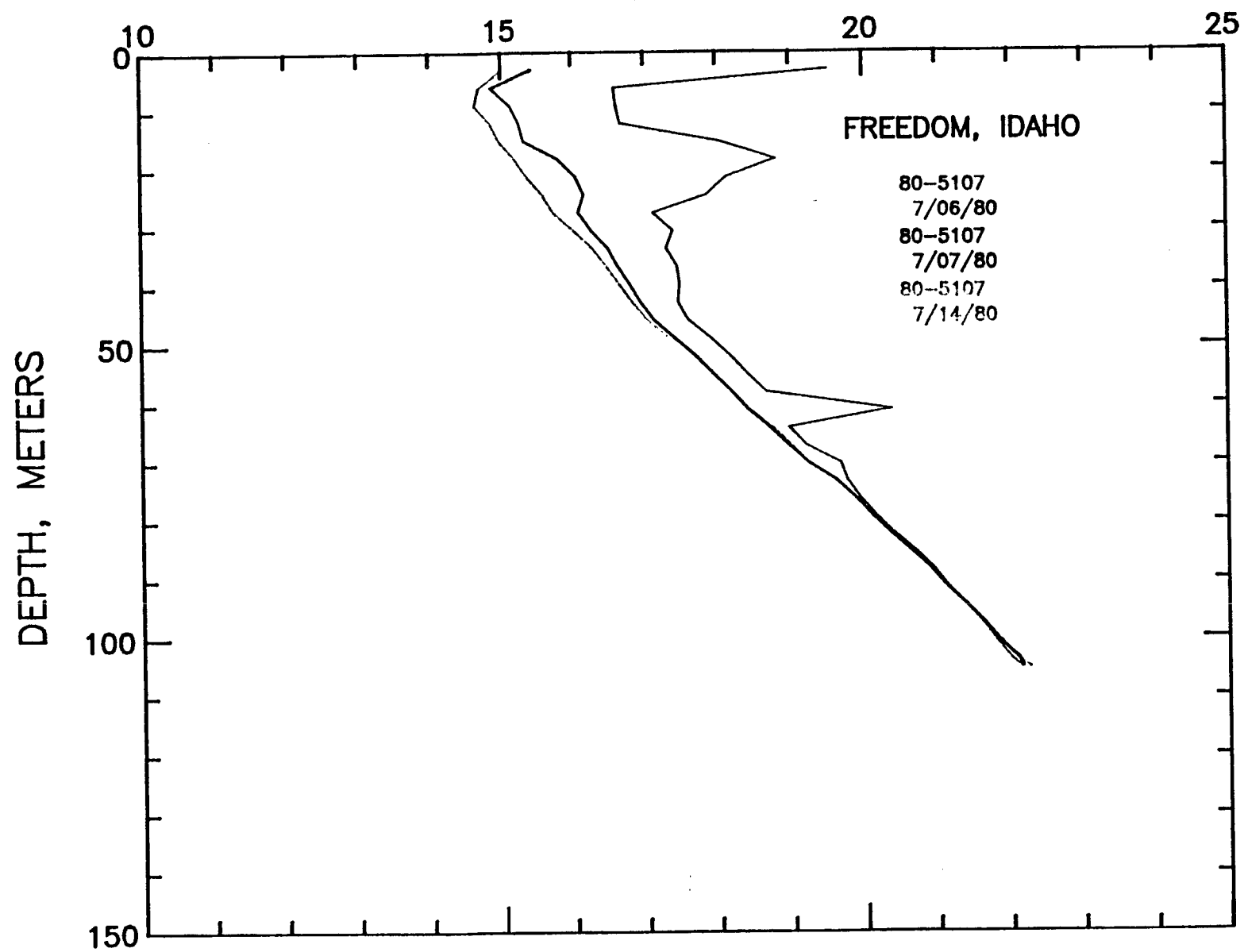


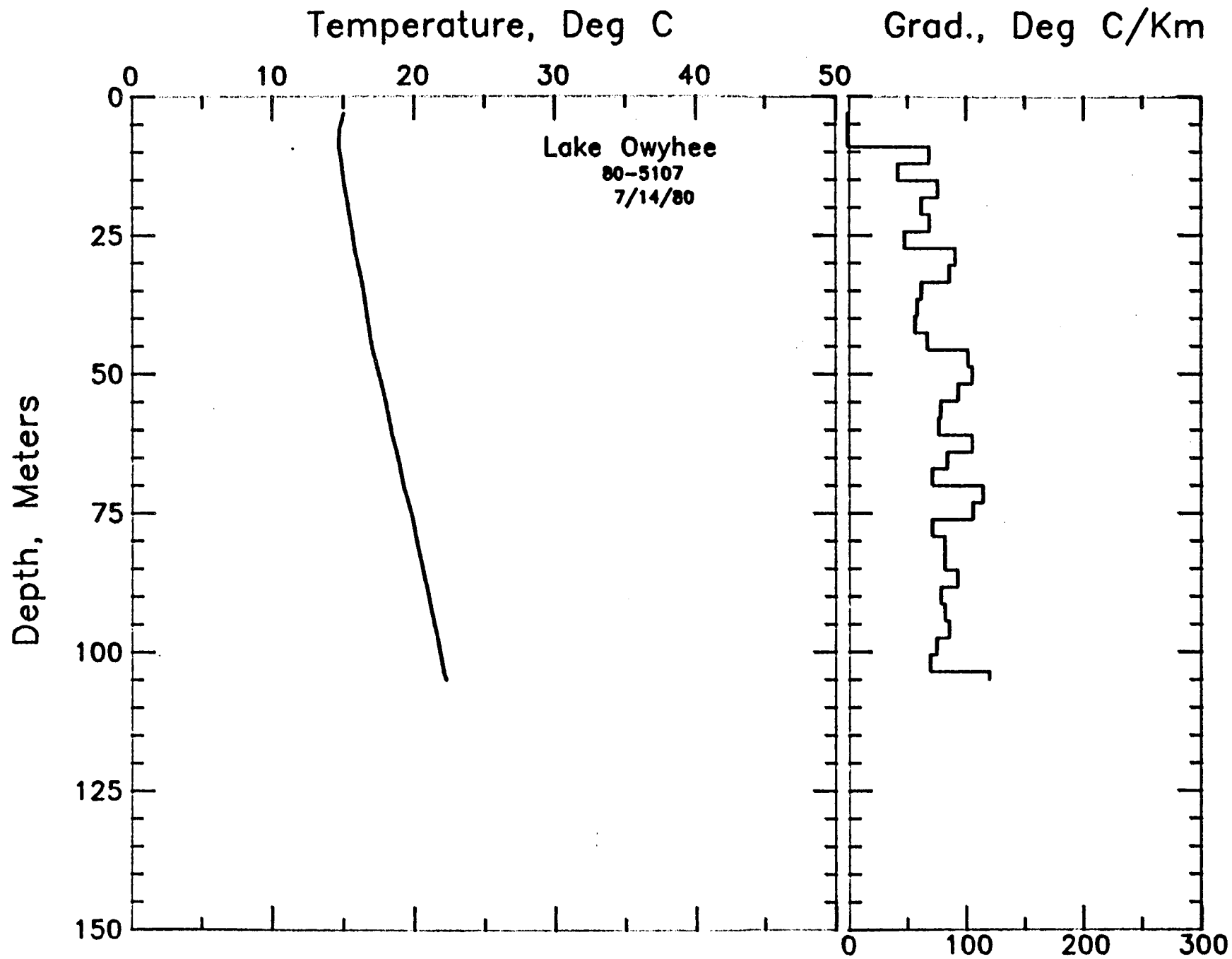
5107  
117°9.175'  
43°42.787'

LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/46E-30CBC  
HOLE NAME: 80-5107  
DATE MEASURED: 7/14/80

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	15.000	0.0
6.1	14.689	-102.1
9.1	14.633	-18.2
12.2	14.844	69.3
15.2	14.972	41.9
18.3	15.206	76.6
21.3	15.394	62.0
24.4	15.606	69.3
27.4	15.750	47.4
30.5	16.028	91.1
33.5	16.289	85.7
36.6	16.478	62.0
39.6	16.656	58.3
42.7	16.828	56.5
45.7	17.033	67.4
48.8	17.344	102.1
51.8	17.667	105.7
54.9	17.950	93.0
57.9	18.189	78.4
61.0	18.422	76.6
64.0	18.744	105.7
67.1	19.000	83.8
70.1	19.217	71.1
73.2	19.567	114.8
76.2	19.889	105.7
79.2	20.106	71.1
82.3	20.356	82.0
85.3	20.606	82.0
88.4	20.889	93.0
91.4	21.128	78.4
94.5	21.378	82.0
97.5	21.639	85.7
100.6	21.867	74.7
103.6	22.078	69.3
105.2	22.261	120.3

TEMPERATURE, DEG C







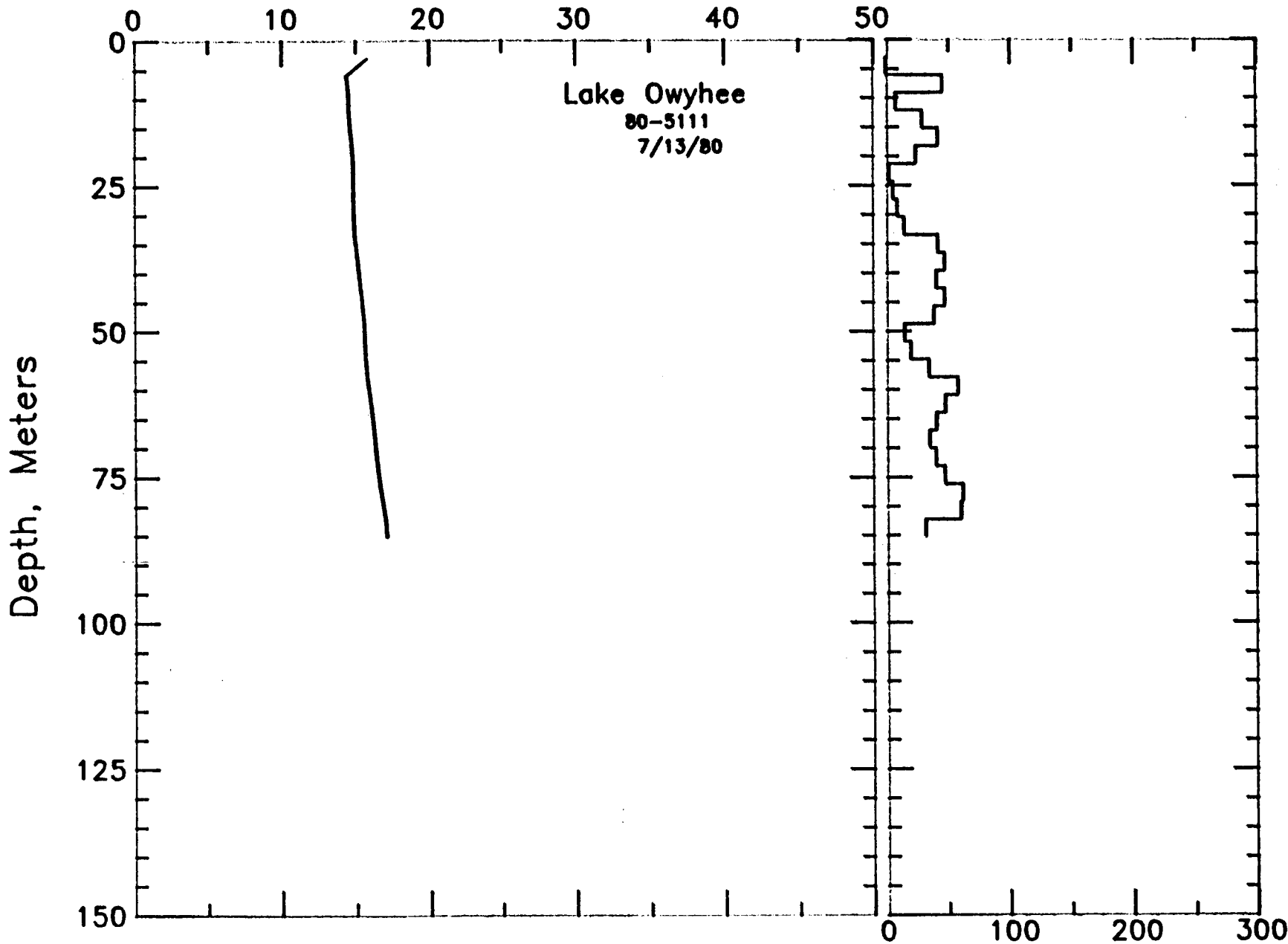


LOCATION: BOISE AMS, OREGON  
T/R-S: 22S/46E-7ADA  
HOLE NAME: 80-5111  
DATE MEASURED: 7/13/80

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	15.744	0.0
6.1	14.328	-464.8
9.1	14.467	45.6
12.2	14.489	7.3
15.2	14.578	29.2
18.3	14.706	41.9
21.3	14.778	23.7
24.4	14.783	1.8
27.4	14.800	5.5
30.5	14.828	9.1
33.5	14.872	14.6
36.6	15.000	41.9
39.6	15.144	47.4
42.7	15.267	40.1
45.7	15.411	47.4
48.8	15.528	38.3
51.8	15.572	14.6
54.9	15.633	20.0
57.9	15.739	34.6
61.0	15.917	58.3
64.0	16.061	47.4
67.1	16.183	40.1
70.1	16.289	34.6
73.2	16.411	40.1
76.2	16.556	47.4
79.2	16.744	62.0
82.3	16.928	60.1
85.3	17.022	31.0

Temperature, Deg C

Grad., Deg C/Km



TEMPERATURE, DEG C

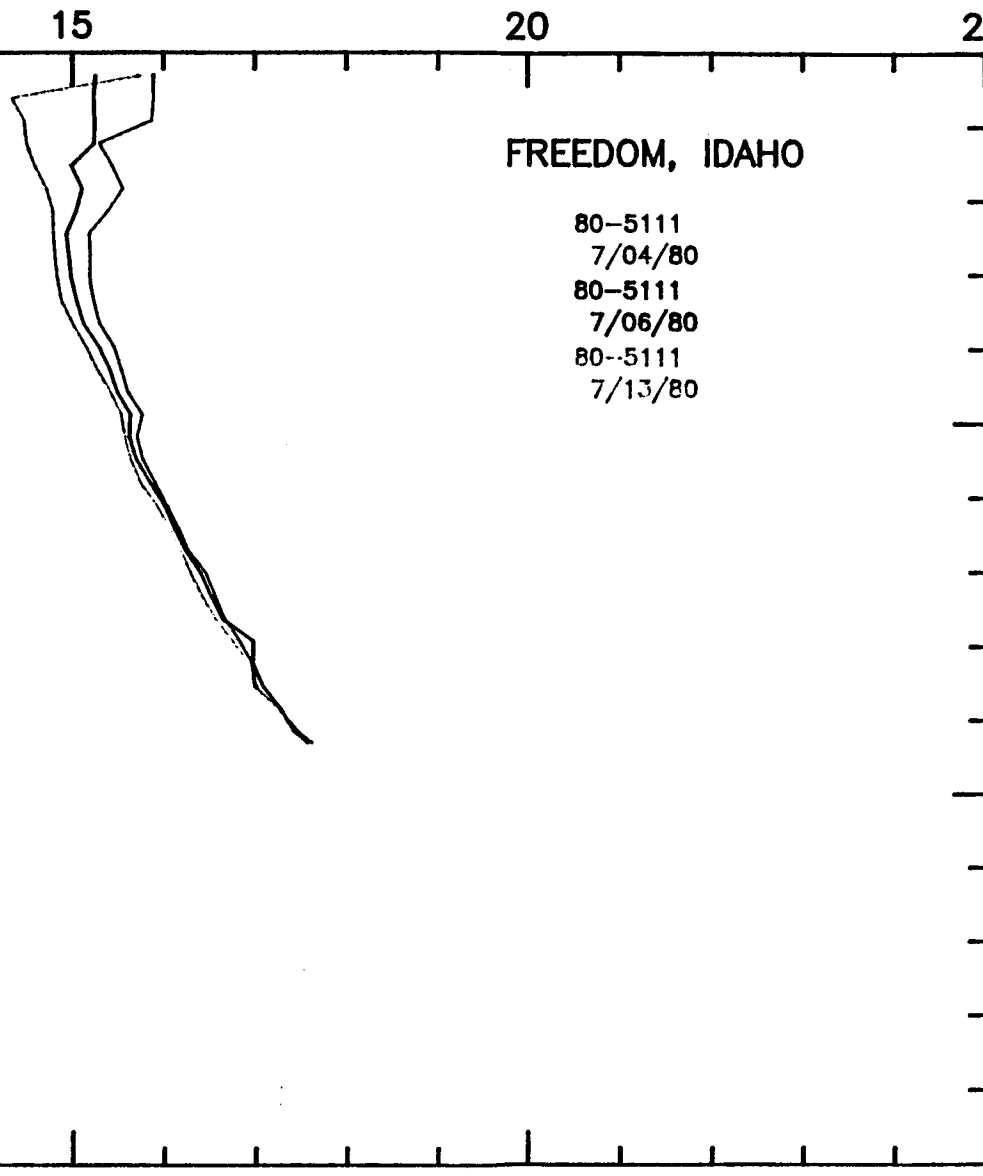
10 15 20 25

DEPTH, METERS

0  
50  
100  
150

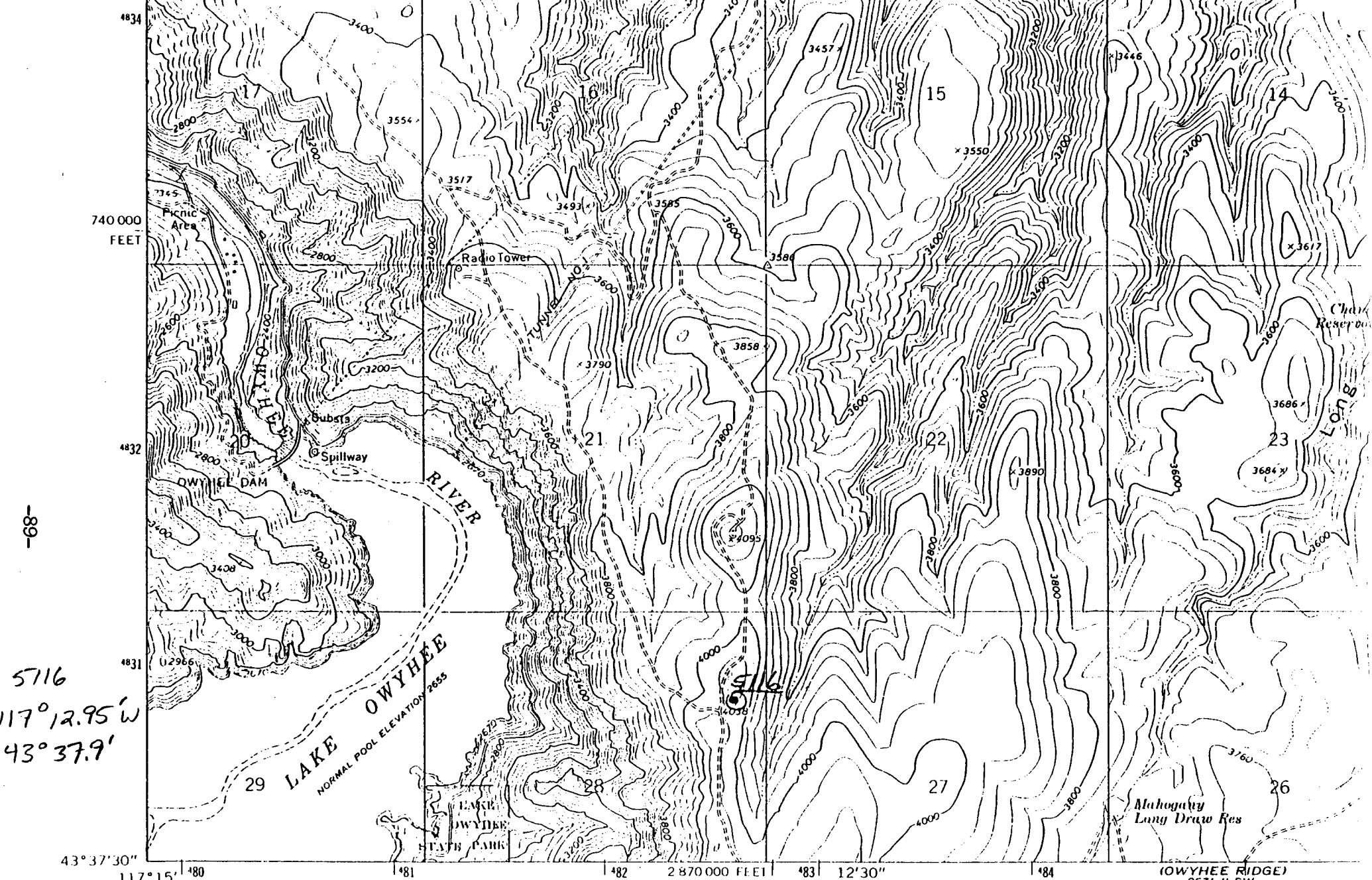
FREEDOM, IDAHO

80-5111  
7/04/80  
80-5111  
7/06/80  
80-5111  
7/13/80



5716  
 117°12.95'W  
 43°37.9'

(THE ELBOW)  
 2571 II SW



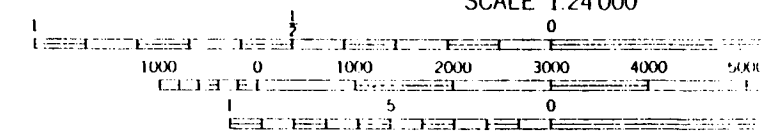
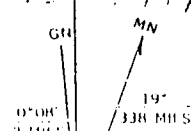
Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1966 and 1967. Field checked 1967

Polyconic projection. 1927 North American datum  
 10,000 foot grid based on Oregon coordinate system.

117°12.95'W  
 43°37.9'



CONTOUR INTERVAL 40 FEET  
 DOTTED LINES REPRESENT 20-FOOT CONTOUR

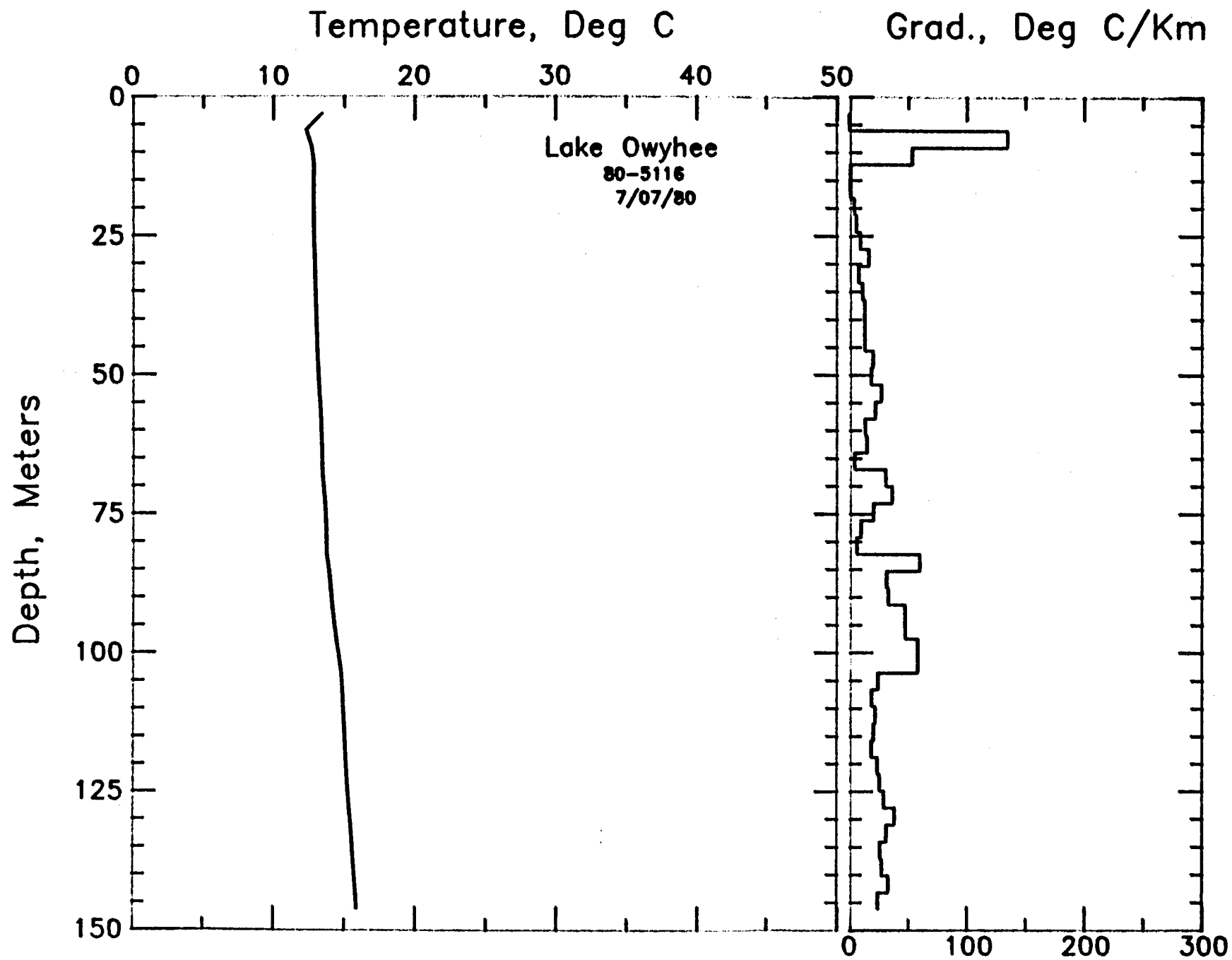
LOCATION: BOISE AMS, OREGON  
T/R-S: 22S/45E-28AAC  
HOLE NAME: 80-5116  
DATE MEASURED: 7/07/80

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	13.411	0.0
6.1	12.239	-384.6
9.1	12.650	134.9
12.2	12.811	52.9
15.2	12.800	-3.6
18.3	12.794	-1.8
21.3	12.806	3.6
24.4	12.822	5.5
27.4	12.850	9.1
30.5	12.900	16.4
33.5	12.922	7.3
36.6	12.956	10.9
39.6	12.994	12.8
42.7	13.033	12.8
45.7	13.072	12.8
48.8	13.133	20.0
51.8	13.189	18.2
54.9	13.272	27.3
57.9	13.339	21.9
61.0	13.378	12.8
64.0	13.422	14.6
67.1	13.433	3.6
70.1	13.528	31.0
73.2	13.639	36.5
76.2	13.700	20.0
79.2	13.728	9.1
82.3	13.744	5.5
85.3	13.928	60.1
88.4	14.022	31.0
91.4	14.122	32.8
94.5	14.267	47.4
97.5	14.411	47.4
100.6	14.589	58.3
103.6	14.767	58.3
106.7	14.839	23.7
109.7	14.894	18.2
112.8	14.961	21.9
115.8	15.022	20.0
118.9	15.078	18.2
121.9	15.150	23.7
125.0	15.228	25.5

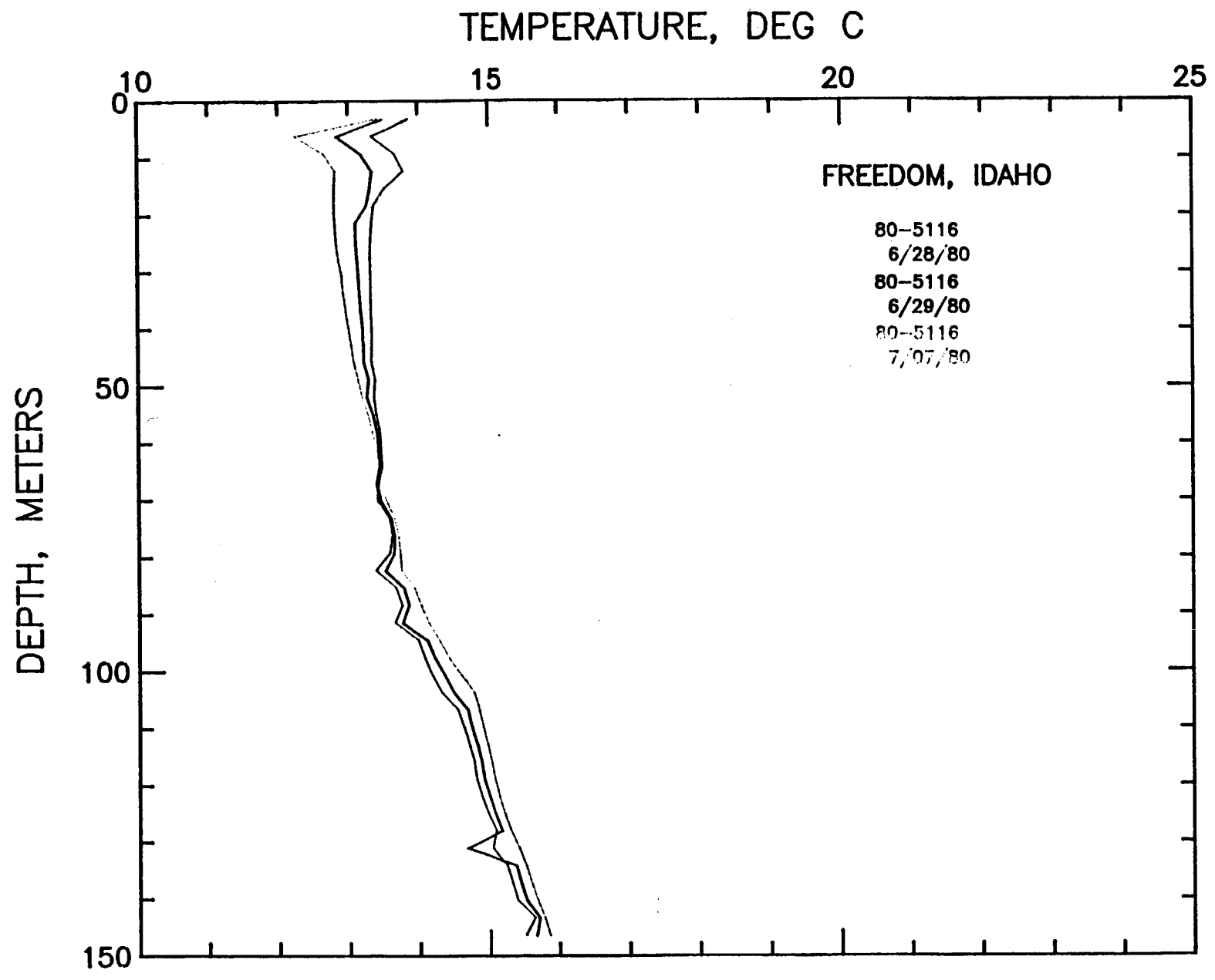
LOCATION: BOISE AMS, OREGON  
T/R-S: 22S/45E-28AAC  
HOLE NAME: 80-5116  
DATE MEASURED: 7/07/80

PAGE 2

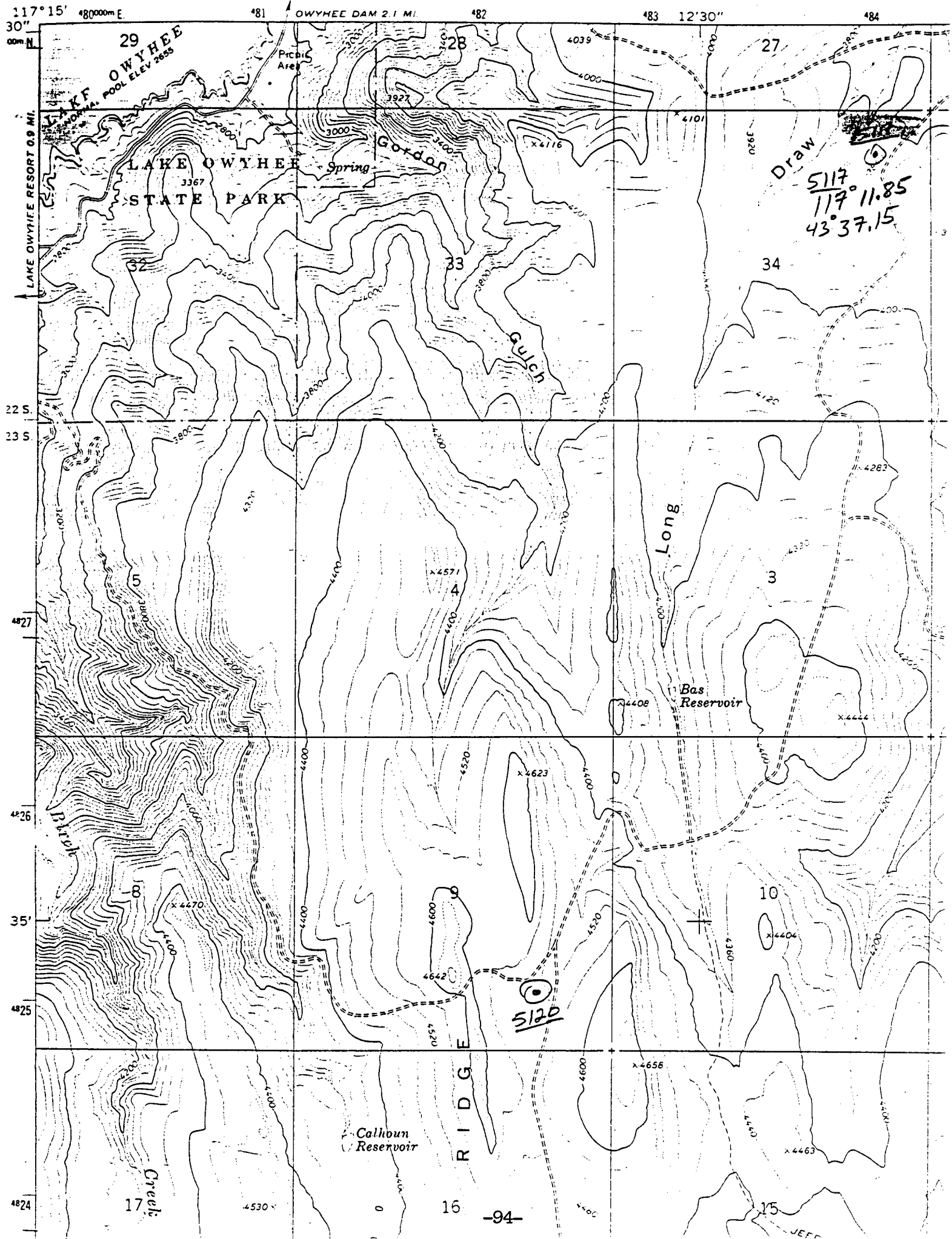
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	15.317	29.2
131.1	15.433	38.3
134.1	15.528	31.0
137.2	15.606	25.5
140.2	15.689	27.3
143.3	15.789	32.8
146.3	15.861	23.7







# GEOLOGICAL SURVEY



LOCATION: BOISE AMS, OREGON  
T/R-S: 22S/45E-34AAC  
HOLE NAME: 80-5117  
DATE MEASURED: 7/04/80

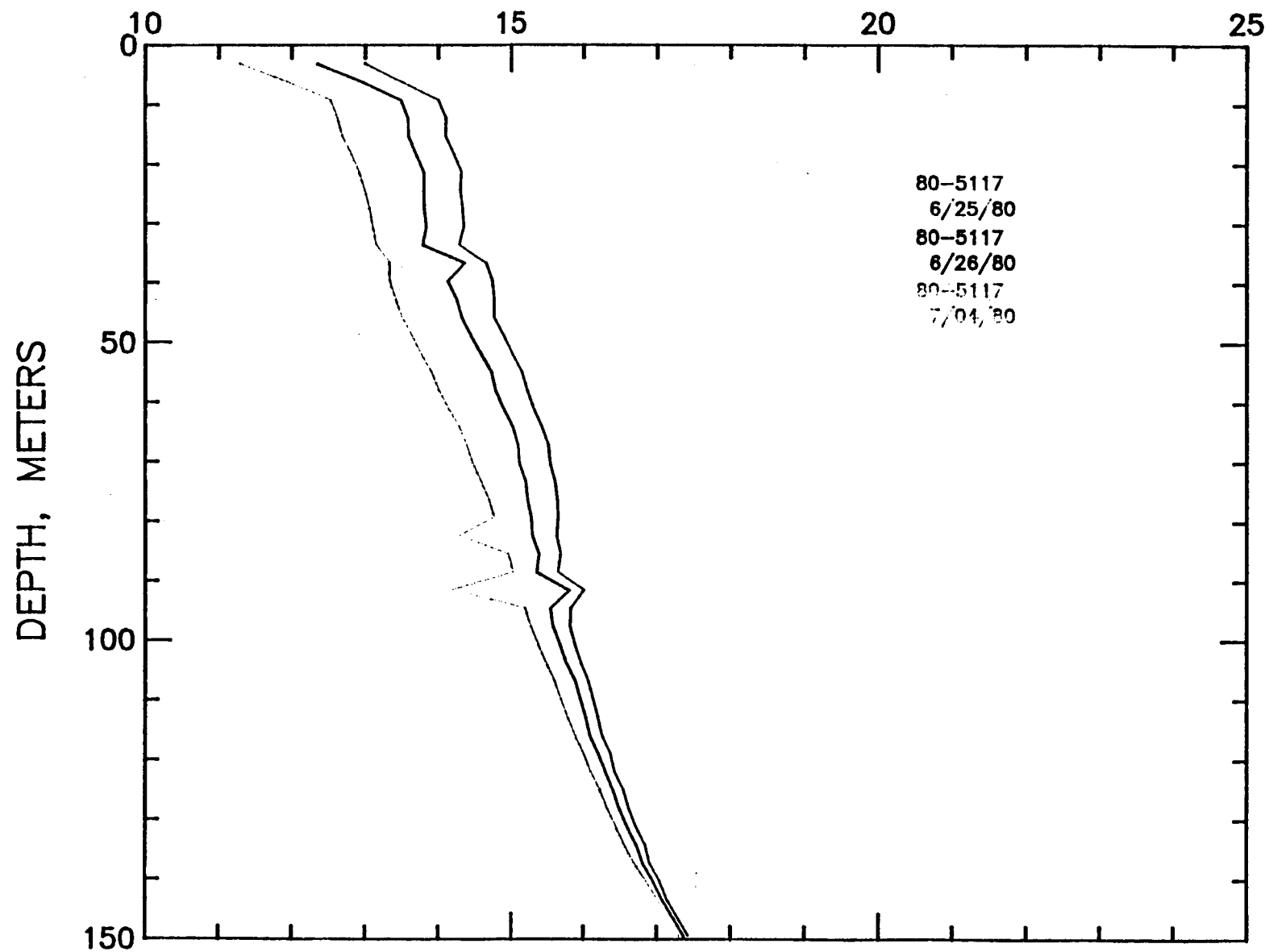
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	11.283	0.0
6.1	11.928	211.4
9.1	12.522	195.0
12.2	12.617	31.0
15.2	12.683	21.9
18.3	12.806	40.1
21.3	12.911	34.6
24.4	12.989	25.5
27.4	13.056	21.9
30.5	13.100	14.6
33.5	13.150	16.4
36.6	13.333	60.1
39.6	13.333	0.0
42.7	13.411	25.5
45.7	13.494	27.3
48.8	13.628	43.7
51.8	13.761	43.7
54.9	13.906	47.4
57.9	14.006	32.8
61.0	14.128	40.1
64.0	14.278	49.2
67.1	14.383	34.6
70.1	14.472	29.2
73.2	14.583	36.5
76.2	14.683	32.8
79.2	14.761	25.5
82.3	14.300	-151.3
85.3	14.950	213.3
88.4	15.028	25.5
91.4	14.189	-275.2
94.5	15.211	335.4
97.5	15.289	25.5
100.6	15.389	32.8
103.6	15.494	34.6
106.7	15.611	38.3
109.7	15.694	27.3
112.8	15.789	31.0
115.8	15.883	31.0
118.9	16.000	38.3
121.9	16.094	31.0
125.0	16.222	41.9

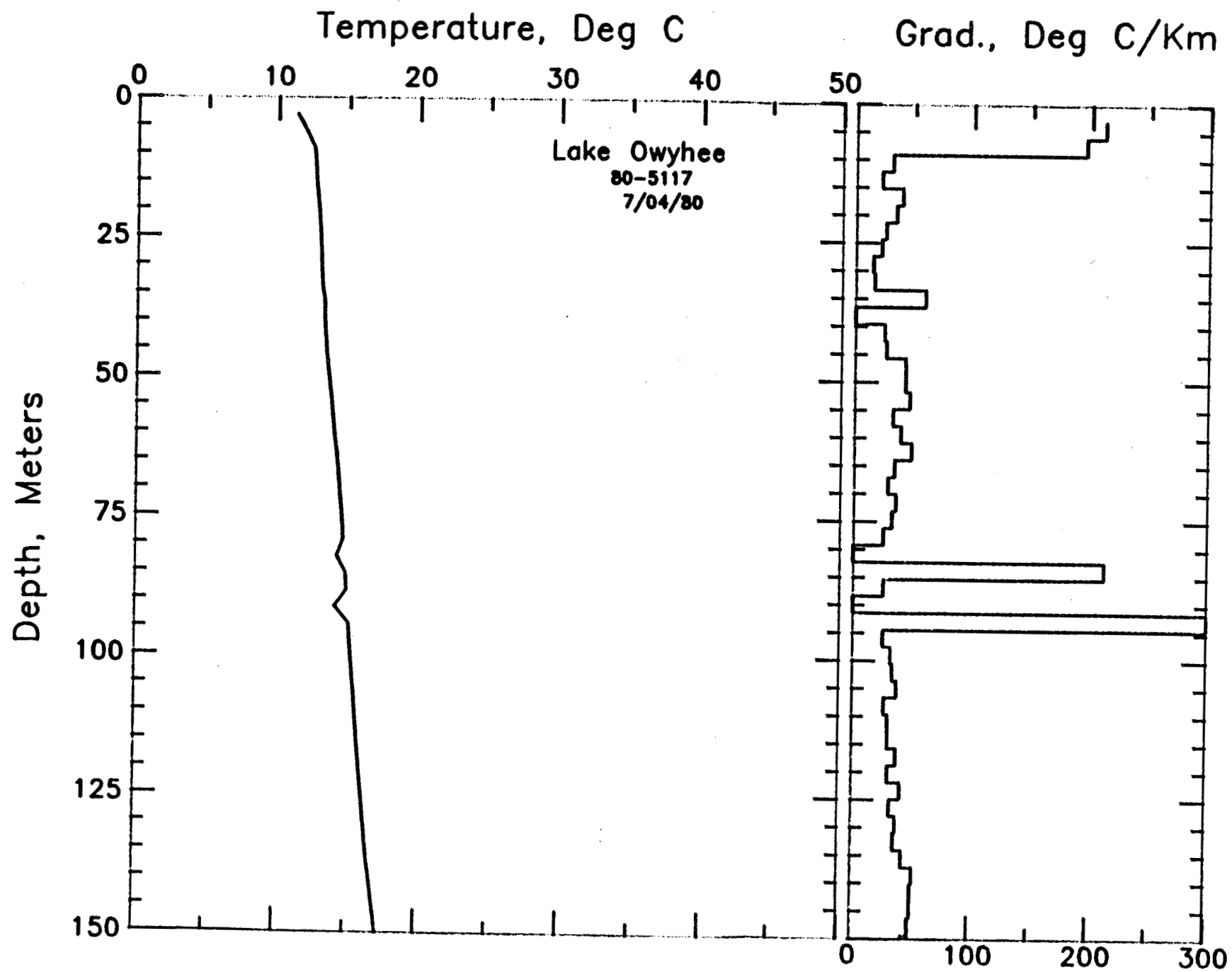
LOCATION: BOISE AMS, OREGON  
T/R-S: 22S/45E-34AAC  
HOLE NAME: 80-5117  
DATE MEASURED: 7/04/80

PAGE 2

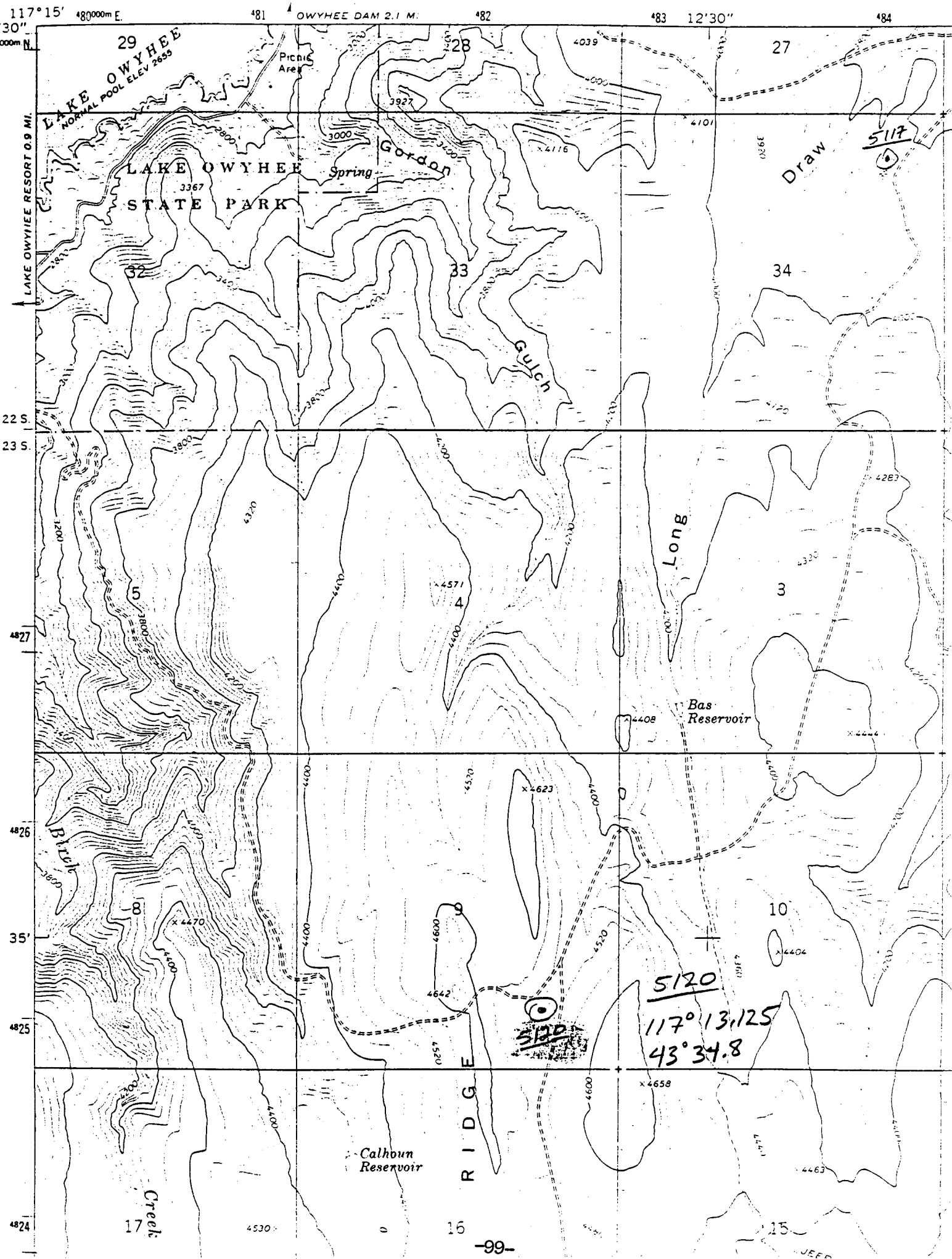
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	16.322	32.8
131.1	16.439	38.3
134.1	16.550	36.5
137.2	16.683	43.7
140.2	16.844	52.9
143.3	17.000	51.0
146.3	17.156	51.0
149.4	17.306	49.2
150.9	17.372	43.7

TEMPERATURE, DEG C





# GEOLOGICAL SURVEY



LOCATION: BOISE AMS, OREGON  
T/R-S: 23S/45E-9DCA  
HOLE NAME: 80-5120  
DATE MEASURED: 6/28/80

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	11.394	0.0
6.1	11.967	187.7
9.1	12.133	54.7
12.2	12.033	-32.8
15.2	12.106	23.7
18.3	12.139	10.9
21.3	12.189	16.4
24.4	12.217	9.1
27.4	12.194	-7.3
30.5	12.200	1.8
33.5	12.222	7.3
36.6	12.233	3.6
39.6	12.244	3.6
42.7	12.278	10.9
45.7	12.294	5.5
48.8	12.317	7.3
51.8	12.322	1.8
54.9	12.656	109.4
57.9	12.622	-10.9
61.0	12.867	80.2
64.0	12.844	-7.3
67.1	12.972	41.9
70.1	12.994	7.3
73.2	13.183	62.0
76.2	13.194	3.6
79.2	13.217	7.3
82.3	13.244	9.1
85.3	13.406	52.9
88.4	13.550	47.4
91.4	13.778	74.7
94.5	13.817	12.8
97.5	14.094	91.1
100.6	14.128	10.9
103.6	14.106	-7.3
106.7	14.300	63.8
109.7	14.339	12.8
112.8	14.606	87.5
115.8	14.667	20.0
118.9	14.922	83.8
121.9	15.089	54.7
125.0	14.989	-32.8

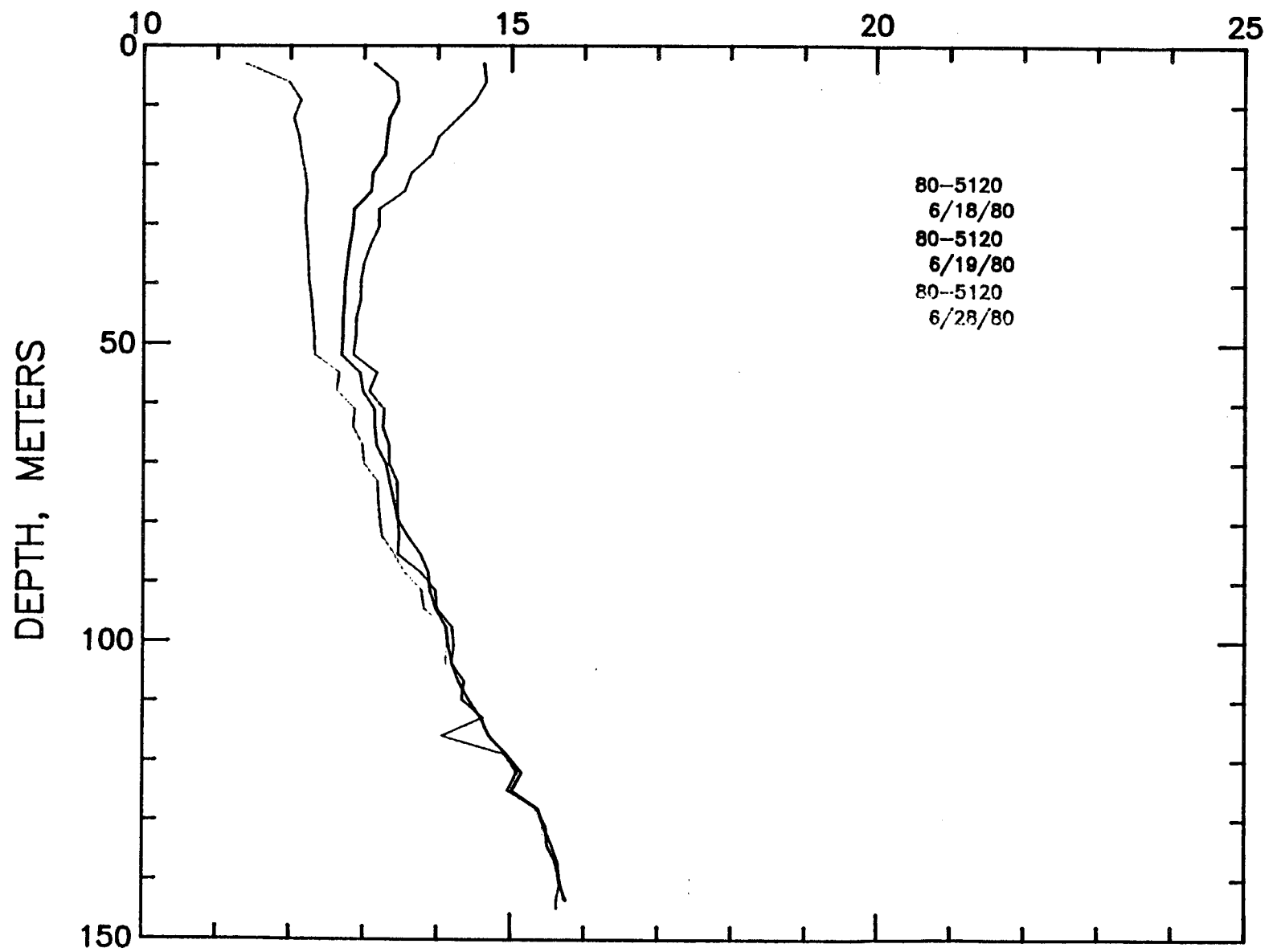


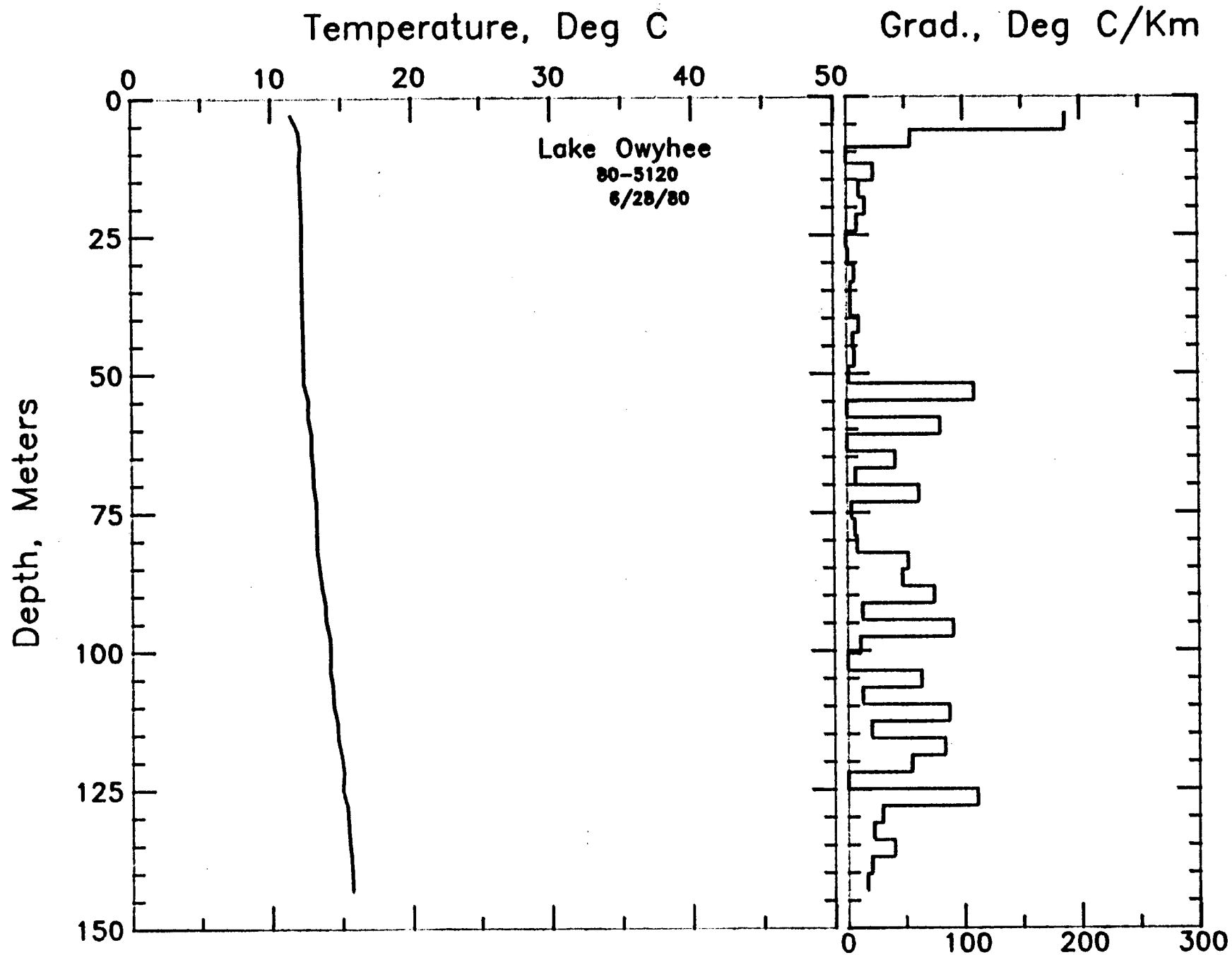
LOCATION: BOISE AMS, OREGON  
T/R-S: 23S/45E-9DCA  
HOLE NAME: 80-5120  
DATE MEASURED: 6/28/80

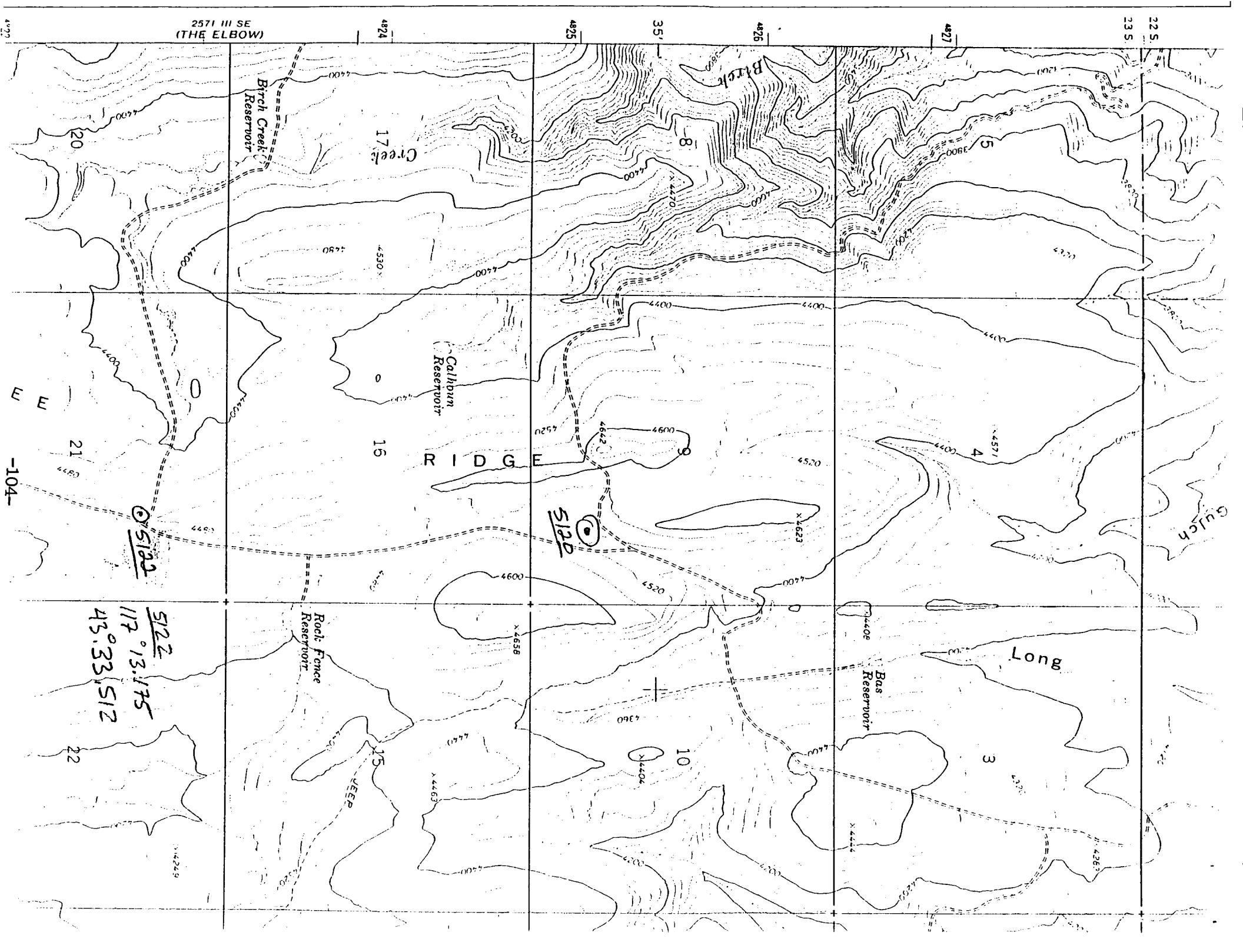
PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	15.328	111.2
131.1	15.417	29.2
134.1	15.483	21.9
137.2	15.606	40.1
140.2	15.667	20.0
143.3	15.717	16.4

TEMPERATURE, DEG C







2571 III SE  
(THE ELBOW)

22.5  
23.5

4827

4826

4825

4824

RIDGE

Gulch

Long

Bas  
Reservoir

Callhorn  
Reservoir

Birch Creek  
Reservoir

Rock Fence  
Reservoir

5122

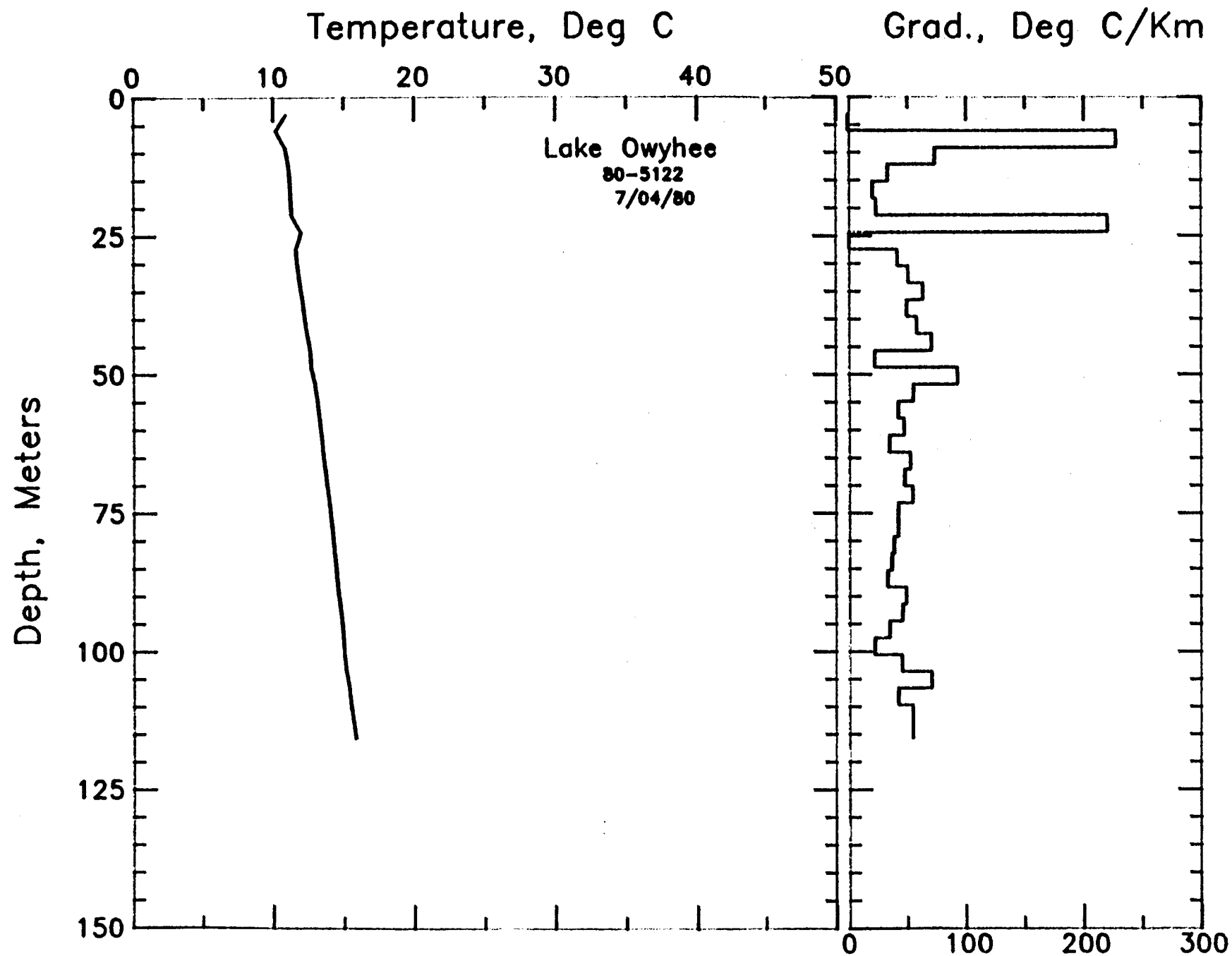
5122

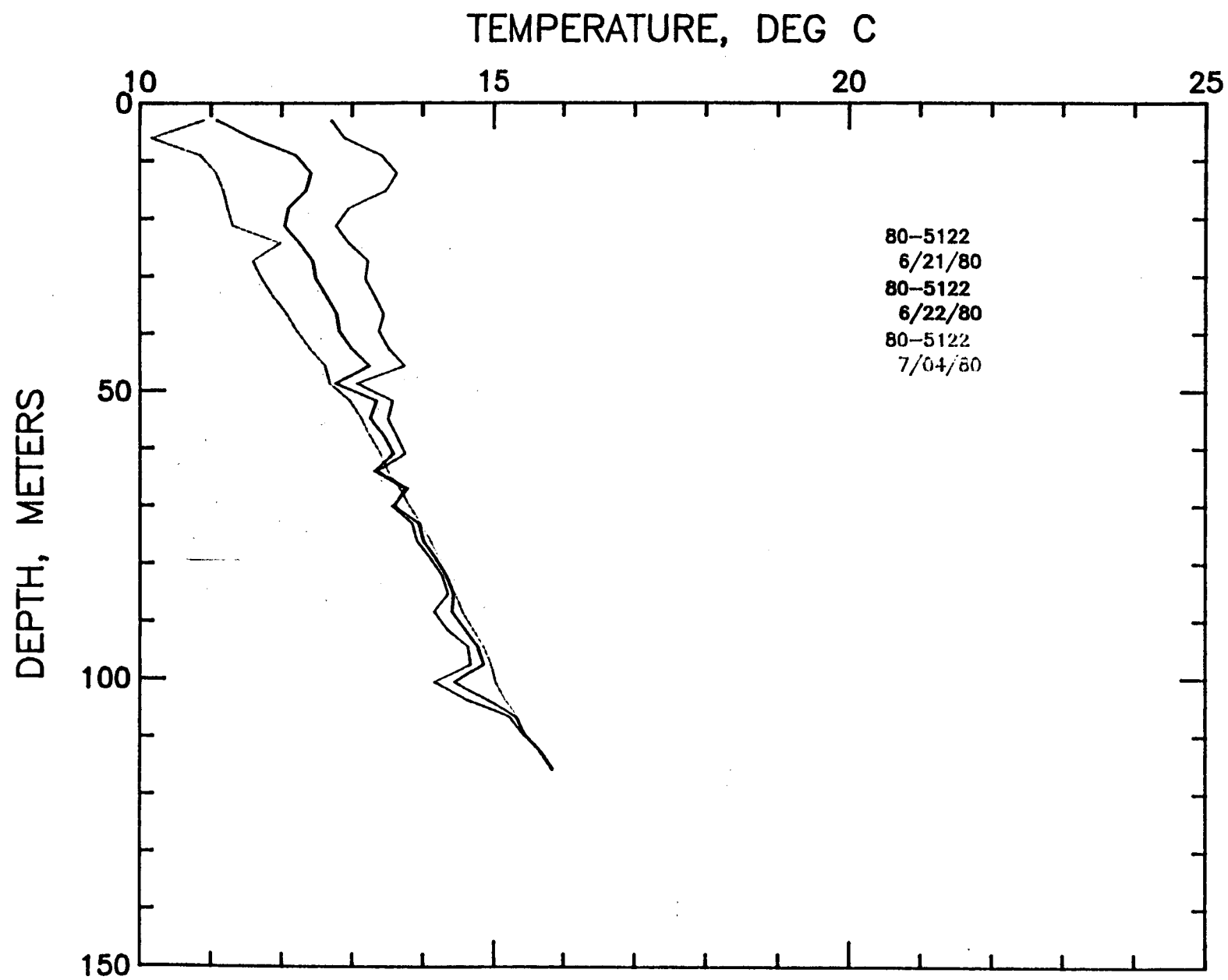
5122  
117, 13, 175  
43, 33, 512

-104-

LOCATION: BOISE AMS, OREGON  
T/R-S: 23S/45E-21ACA  
HOLE NAME: 80-5122  
DATE MEASURED: 7/04/80

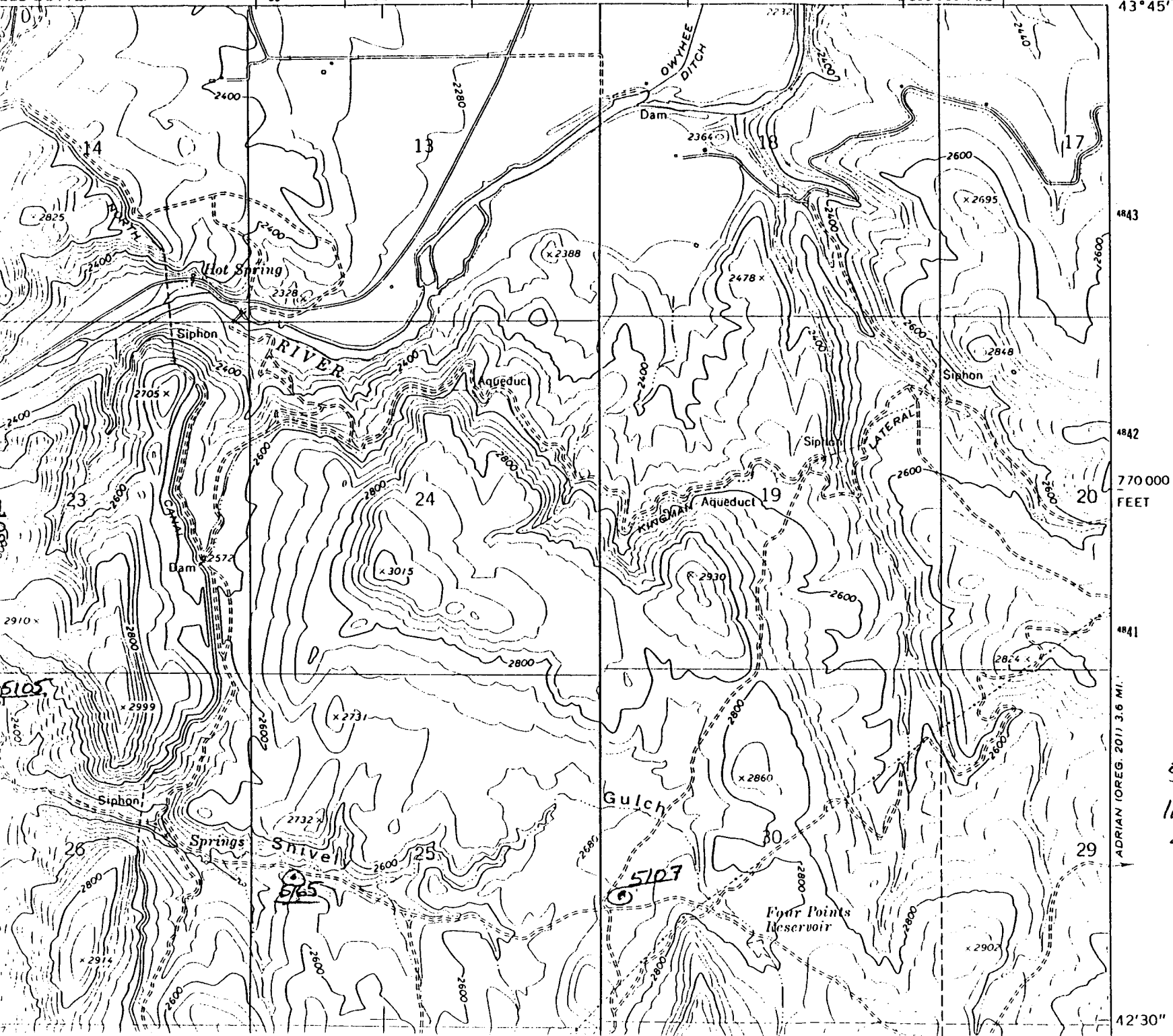
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	10.894	0.0
6.1	10.156	-242.4
9.1	10.850	227.8
12.2	11.072	72.9
15.2	11.172	32.8
18.3	11.233	20.0
21.3	11.306	23.7
24.4	11.978	220.5
27.4	11.589	-127.6
30.5	11.717	41.9
33.5	11.872	51.0
36.6	12.067	63.8
39.6	12.217	49.2
42.7	12.394	58.3
45.7	12.611	71.1
48.8	12.678	21.9
51.8	12.961	93.0
54.9	13.128	54.7
57.9	13.256	41.9
61.0	13.400	47.4
64.0	13.506	34.6
67.1	13.667	52.9
70.1	13.811	47.4
73.2	13.978	54.7
76.2	14.106	41.9
79.2	14.233	41.9
82.3	14.350	38.3
85.3	14.461	36.5
88.4	14.561	32.8
91.4	14.711	49.2
94.5	14.850	45.6
97.5	14.956	34.6
100.6	15.022	21.9
103.6	15.161	45.6
106.7	15.378	71.1
109.7	15.506	41.9
112.8	15.672	54.7
115.8	15.839	54.7





711 SW  
ELL BUTTE)

486 10' OWYHEE 7 MI. R. 45 E. R. 46 E. 488 2890 000 FEET 117° 07' 30" 43° 45'



5165  
117° 10.325'  
43° 42.85'

ADRIAN (OREG. 201) 3.6 MI.



LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-25CBB  
HOLE NAME: 81-5165  
DATE MEASURED: 7/28/81

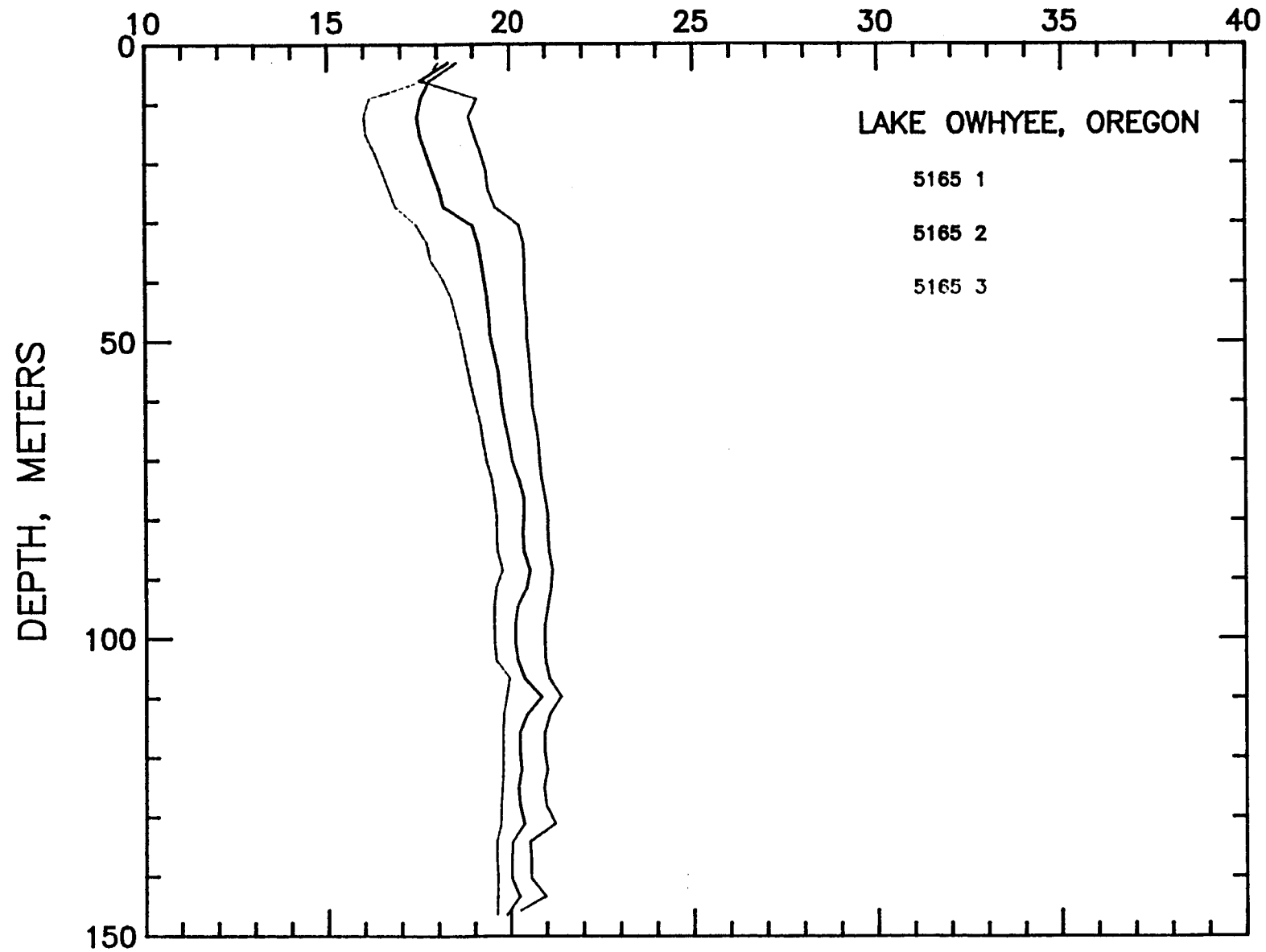
DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	18.022	0.0
6.1	17.678	-113.0
9.1	16.150	-501.2
12.2	16.000	-49.2
15.2	16.050	16.4
18.3	16.289	78.4
21.3	16.489	65.6
24.4	16.672	60.1
27.4	16.850	58.3
30.5	17.439	193.2
33.5	17.722	93.0
36.6	17.828	34.6
39.6	18.139	102.1
42.7	18.372	76.6
45.7	18.500	41.9
48.8	18.639	45.6
51.8	18.750	36.5
54.9	18.850	32.8
57.9	18.950	32.8
61.0	19.061	36.5
64.0	19.178	38.3
67.1	19.239	20.0
70.1	19.328	29.2
73.2	19.472	47.4
76.2	19.539	21.9
79.2	19.600	20.0
82.3	19.600	0.0
85.3	19.622	7.3
88.4	19.761	45.6
91.4	19.578	-60.1
94.5	19.522	-18.2
97.5	19.522	0.0
100.6	19.528	1.8
103.6	19.578	16.4
106.7	19.972	129.4
109.7	19.878	-31.0
112.8	19.789	-29.2
115.8	19.761	-9.1
118.9	19.761	0.0
121.9	19.761	0.0
125.0	19.739	-7.3

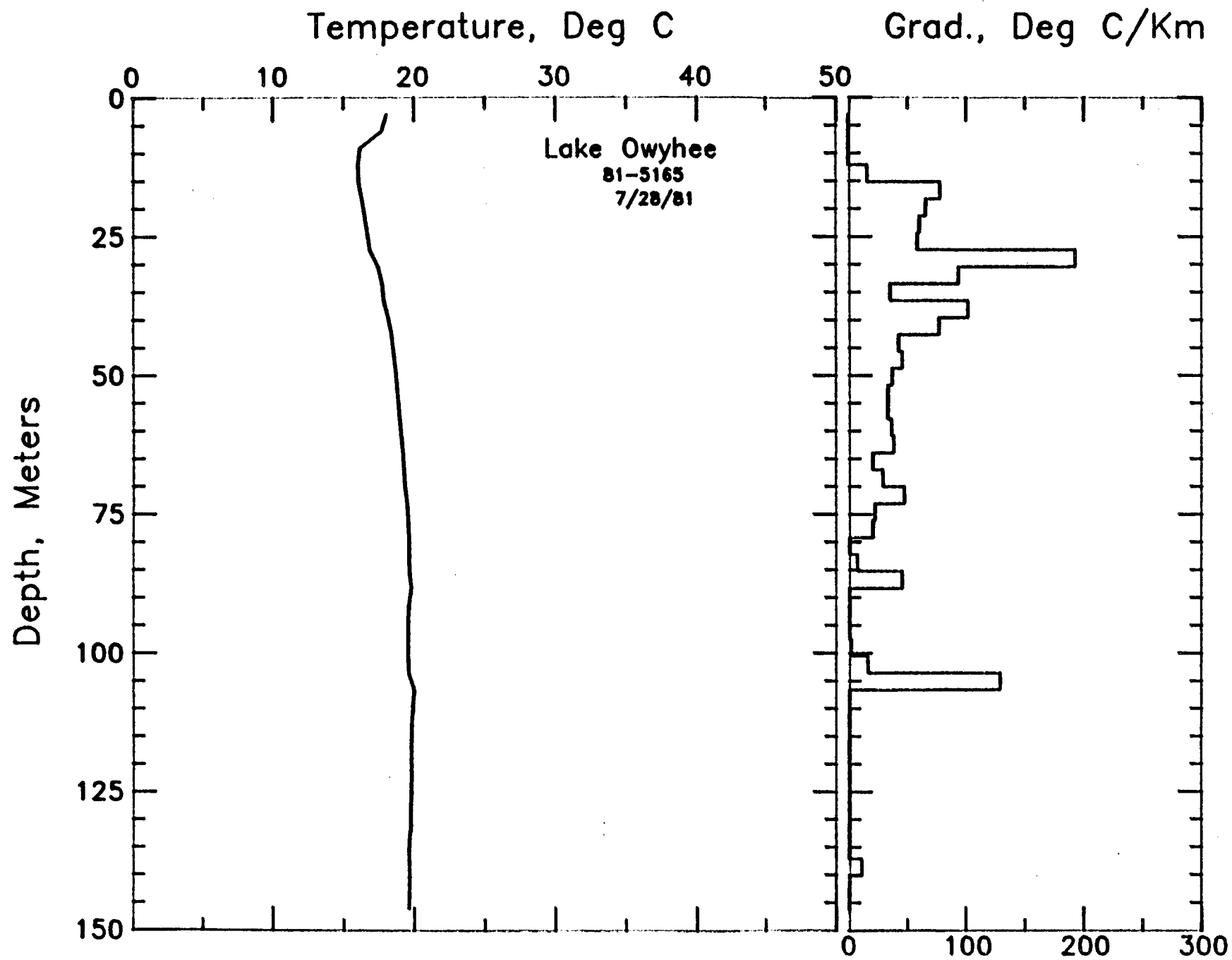
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-25CBB  
HOLE NAME: 81-5165  
DATE MEASURED: 7/28/81

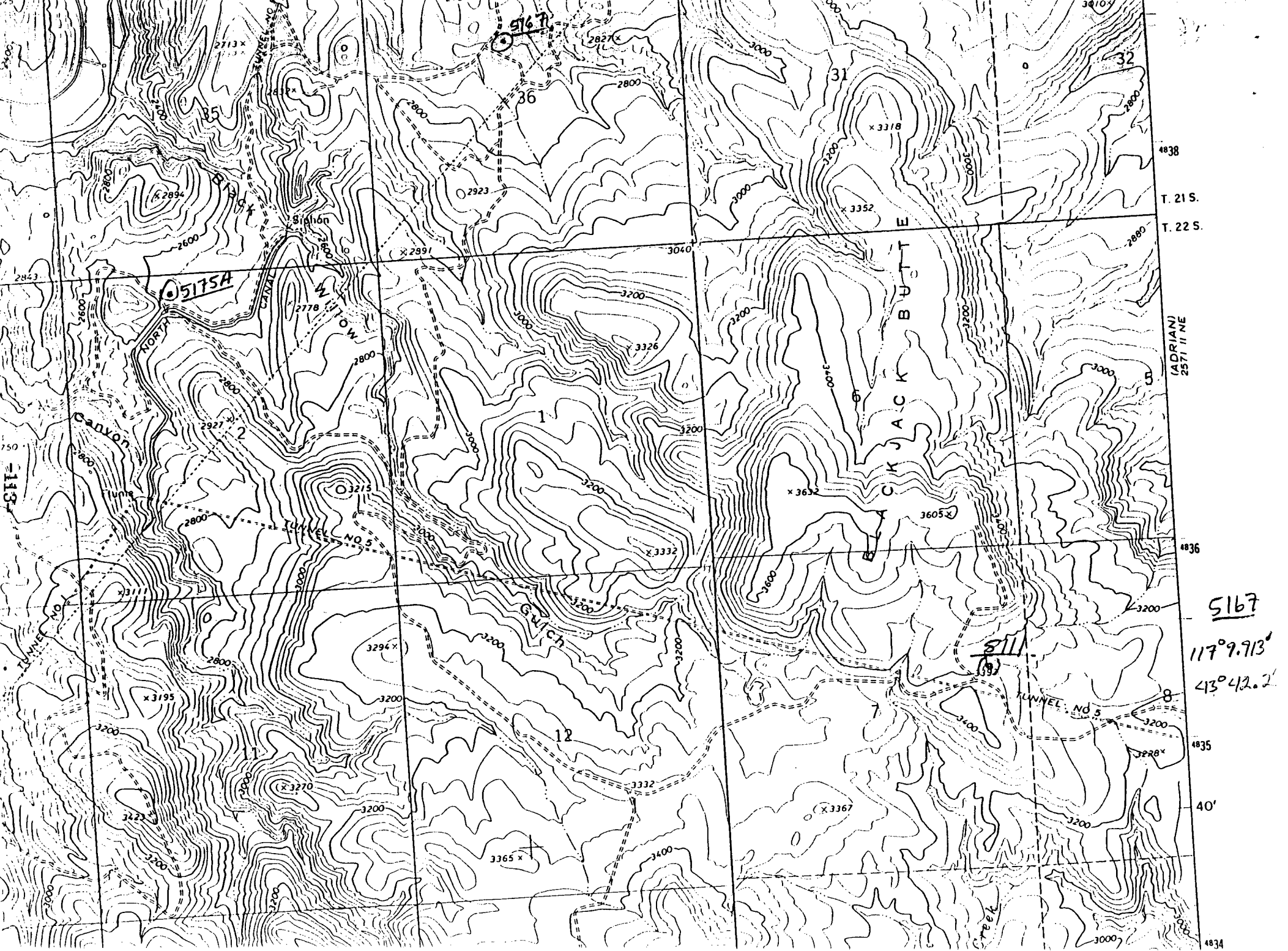
PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	19.700	-12.8
131.1	19.700	0.0
134.1	19.578	-40.1
137.2	19.578	0.0
140.2	19.611	10.9
143.3	19.600	-3.6
146.3	19.589	-3.6

TEMPERATURE, DEG C







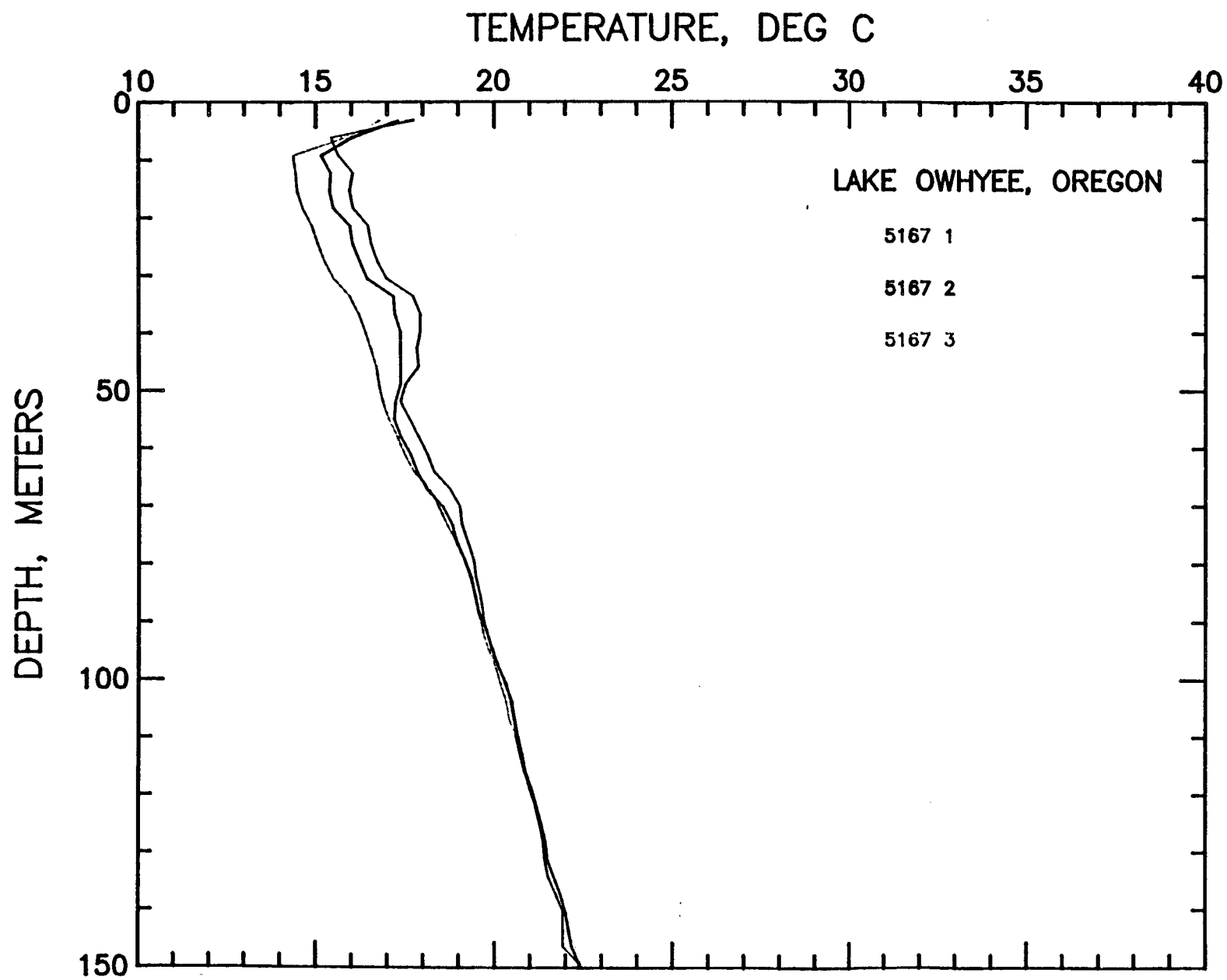
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-36BDA  
HOLE NAME: 81-5167  
DATE MEASURED: 7/31/81

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	16.789	0.0
6.1	15.789	-328.1
9.1	14.350	-472.1
12.2	14.422	23.7
15.2	14.461	12.8
18.3	14.622	52.9
21.3	14.872	82.0
24.4	15.039	54.7
27.4	15.228	62.0
30.5	15.489	85.7
33.5	15.939	147.6
36.6	16.189	82.0
39.6	16.372	60.1
42.7	16.539	54.7
45.7	16.689	49.2
48.8	16.761	23.7
51.8	16.872	36.5
54.9	17.039	54.7
57.9	17.272	76.6
61.0	17.489	71.1
64.0	17.750	85.7
67.1	18.211	151.3
70.1	18.439	74.7
73.2	18.678	78.4
76.2	18.950	89.3
79.2	19.172	72.9
82.3	19.322	49.2
85.3	19.472	49.2
88.4	19.550	25.5
91.4	19.672	40.1
94.5	19.828	51.0
97.5	20.028	65.6
100.6	20.178	49.2
103.6	20.339	52.9
106.7	20.428	29.2
109.7	20.600	56.5
112.8	20.711	36.5
115.8	20.839	41.9
118.9	21.050	69.3
121.9	21.161	36.5
125.0	21.278	38.3

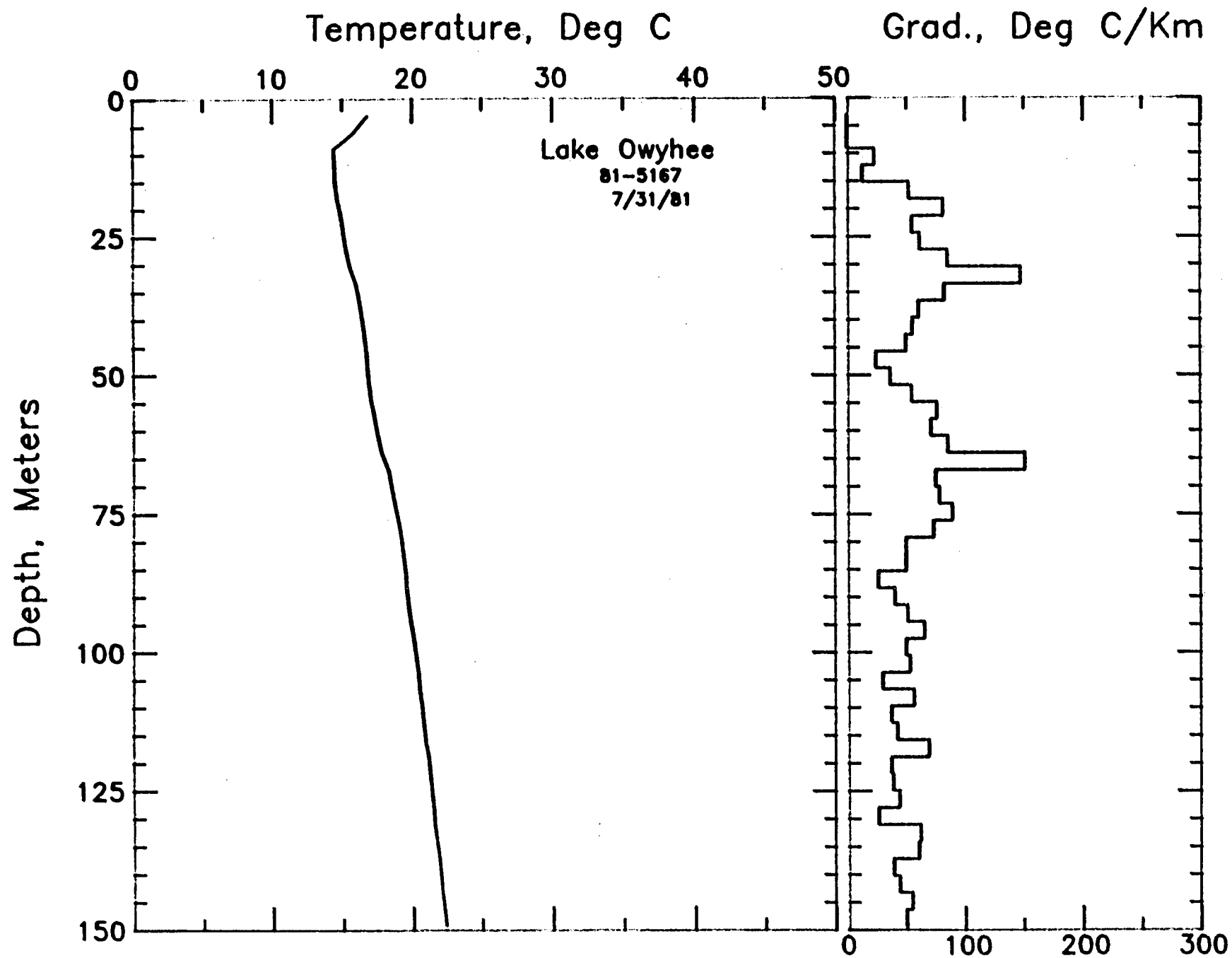
LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-36BDA  
HOLE NAME: 81-5167  
DATE MEASURED: 7/31/81

PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	21.411	43.7
131.1	21.489	25.5
134.1	21.678	62.0
137.2	21.861	60.1
140.2	21.978	38.3
143.3	22.111	43.7
146.3	22.278	54.7
149.4	22.428	49.2







117° 15' 480  
43° 45'

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

117° 15' 480 481000m E 482 483 12' 30"

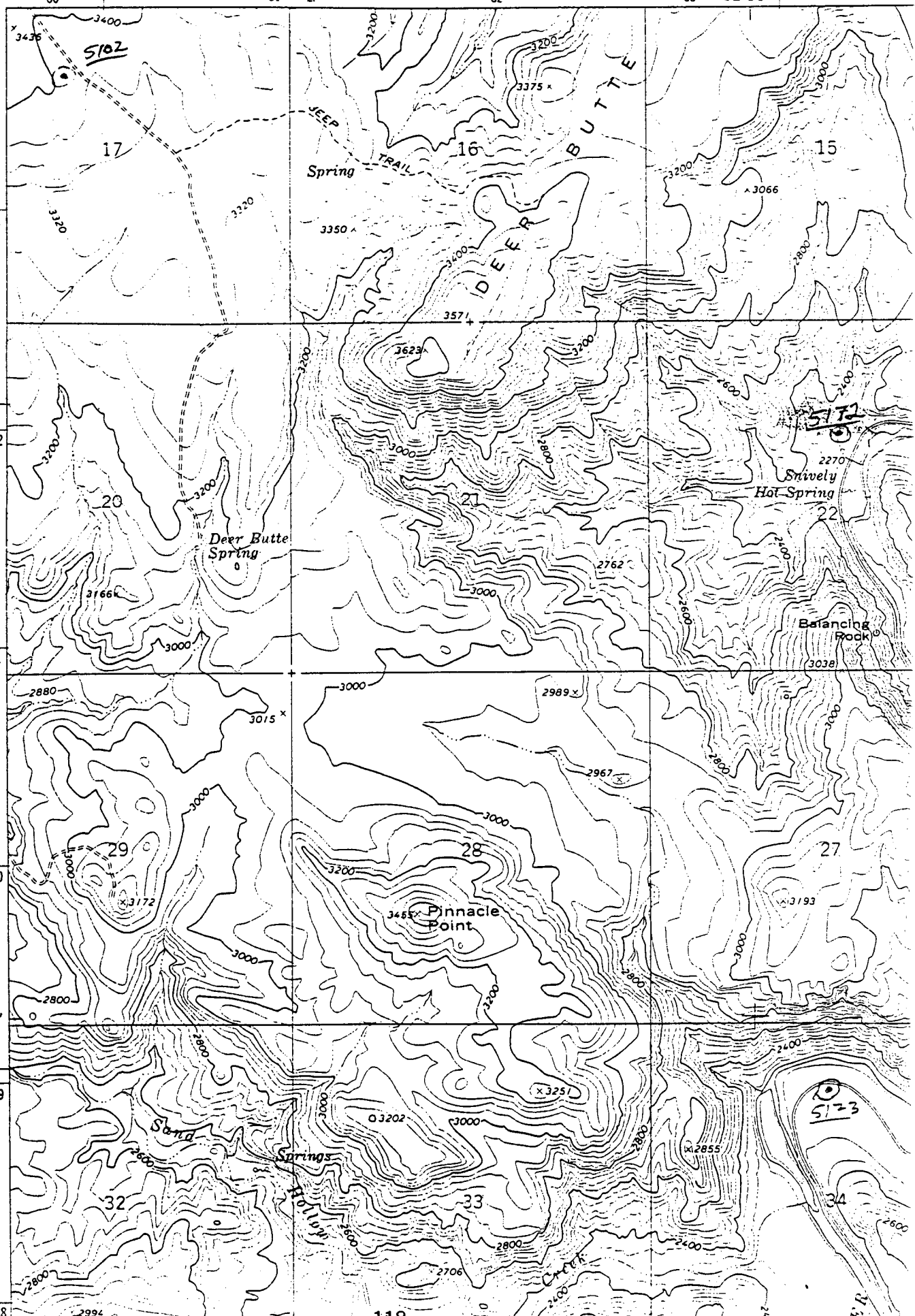
4843000m N

5172  
117° 11.76  
43° 43.95

42' 30"

4839

4838



LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-22ACB  
HOLE NAME: 81-5172  
DATE MEASURED: 7/21/81

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	22.878	0.0
6.1	22.661	-71.1
9.1	23.750	357.2
12.2	25.972	729.1
15.2	29.450	1141.0
18.3	31.478	665.3
21.3	32.272	260.6
24.4	33.178	297.1
27.4	34.328	377.3
30.5	35.628	426.5
33.5	35.889	85.7
36.6	36.072	60.1
39.6	36.150	25.5
42.7	36.178	9.1
45.7	36.122	-18.2
48.8	35.822	-98.4
51.8	35.522	-98.4
54.9	35.350	-56.5
57.9	35.228	-40.1
61.0	35.278	16.4
64.0	35.300	7.3
67.1	35.339	12.8
70.1	35.378	12.8
73.2	35.472	31.0
76.2	35.722	82.0
79.2	35.961	78.4
82.3	36.122	52.9
85.3	36.372	82.0
88.4	36.611	78.4
91.4	36.850	78.4
94.5	37.111	85.7
97.5	37.372	85.7
100.6	37.639	87.5
103.6	37.961	105.7
106.7	38.339	123.9
109.7	38.772	142.2
112.8	39.228	149.5
115.8	39.772	178.6
118.9	40.322	180.4
121.9	40.789	153.1
125.0	41.328	176.8

LOCATION: BOISE AMS, OREGON  
T/R-S: 21S/45E-22ACB  
HOLE NAME: 81-5172  
DATE MEASURED: 7/21/81

PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	41.900	187.7
131.1	42.561	216.9
134.1	43.278	235.1
137.2	44.172	293.5
140.2	44.789	202.3
143.3	45.500	233.3
146.3	45.600	32.8
149.4	45.678	25.5
152.4	45.728	16.4

TEMPERATURE, DEG C

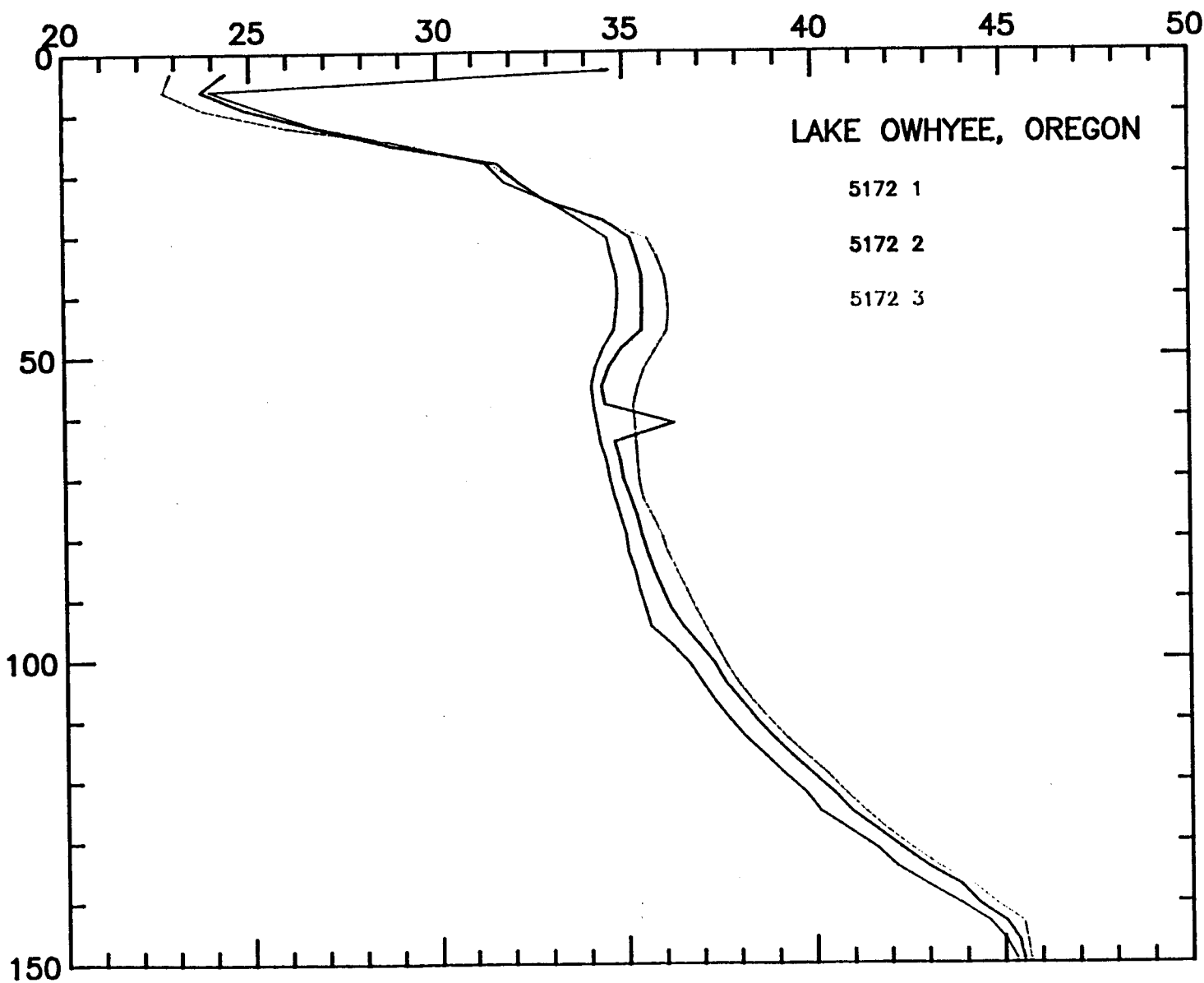
LAKE OWHYEE, OREGON

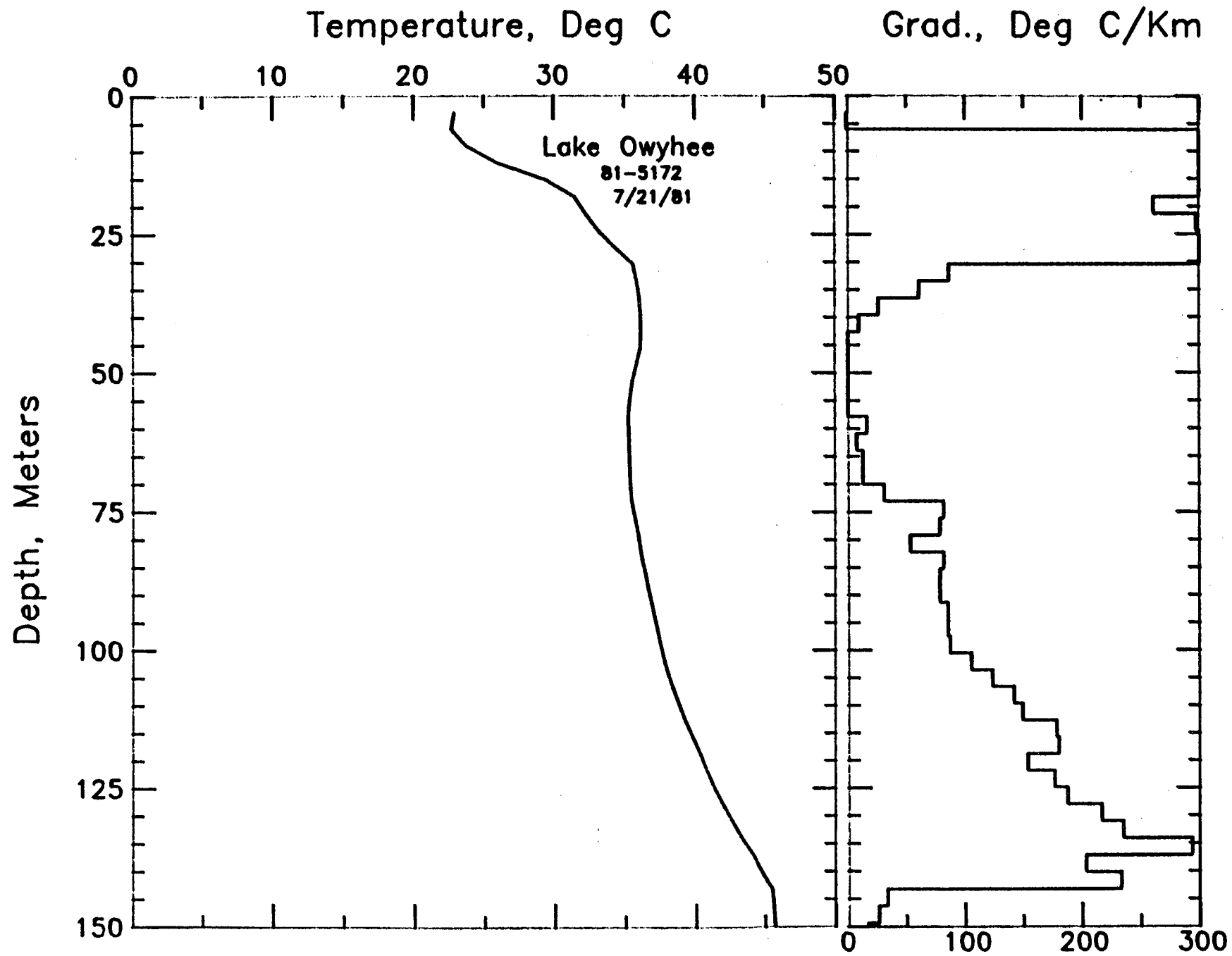
5172 1

5172 2

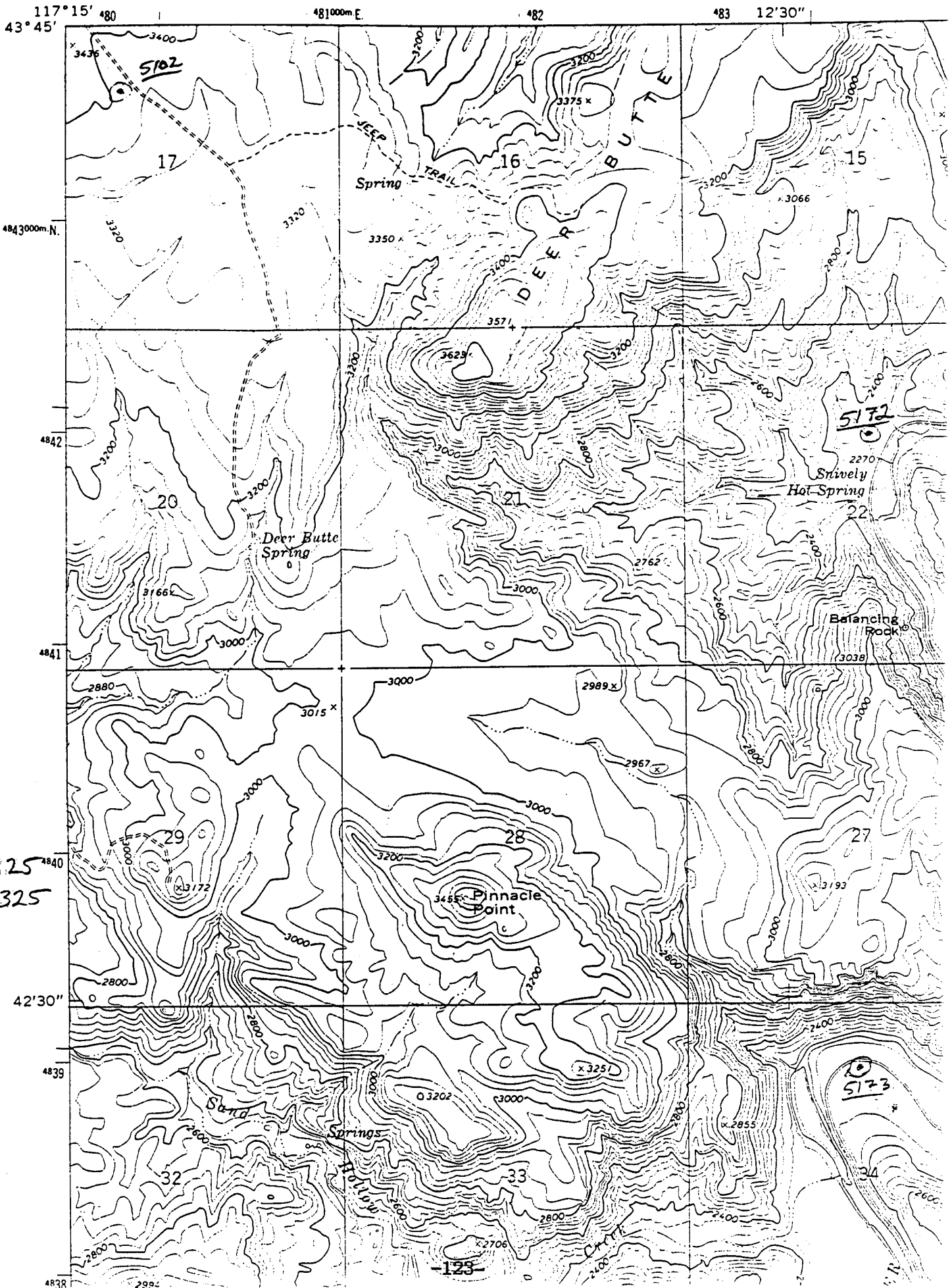
5172 3

DEPTH, METERS





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY



LOCATION: BOISE AMS, OREGON  
T/R-S: 1S/45E-34BAD  
HOLE NAME: 81-5173  
DATE MEASURED: 8/7/812

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	18.400	0.0
6.1	18.128	-89.3
9.1	18.389	85.7
12.2	18.422	10.9
15.2	18.861	144.0
18.3	18.978	38.3
21.3	19.678	229.7
24.4	20.072	129.4
27.4	20.539	153.1
30.5	20.911	122.1
33.5	21.261	114.8
36.6	21.828	185.9
39.6	22.539	233.3
42.7	23.072	175.0
45.7	23.722	213.3
48.8	24.339	202.3
51.8	24.772	142.2
54.9	25.089	103.9
57.9	25.461	122.1
61.0	25.978	169.5
64.0	26.500	171.3
67.1	27.022	171.3
70.1	27.539	169.5
73.2	28.189	213.3
76.2	28.689	164.0
79.2	29.122	142.2
82.3	29.572	147.6
85.3	30.022	147.6
88.4	30.489	153.1
91.4	31.028	176.8
94.5	31.600	187.7
97.5	32.122	171.3
100.6	32.750	206.0
103.6	33.489	242.4
106.7	34.028	176.8
109.7	34.528	164.0
112.8	35.139	200.5
115.8	35.722	191.4
118.9	36.239	169.5
121.9	36.772	175.0
125.0	37.322	180.4

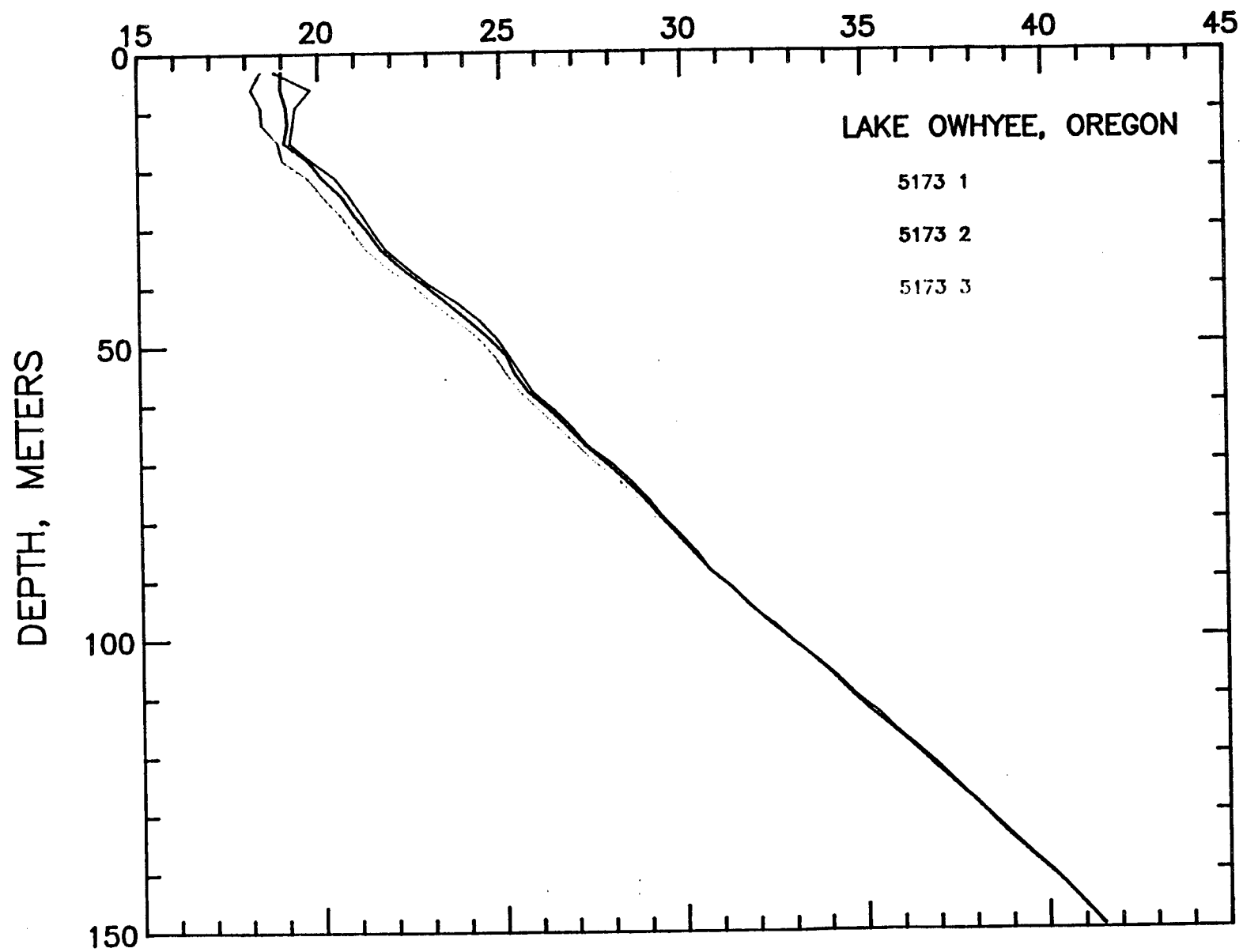


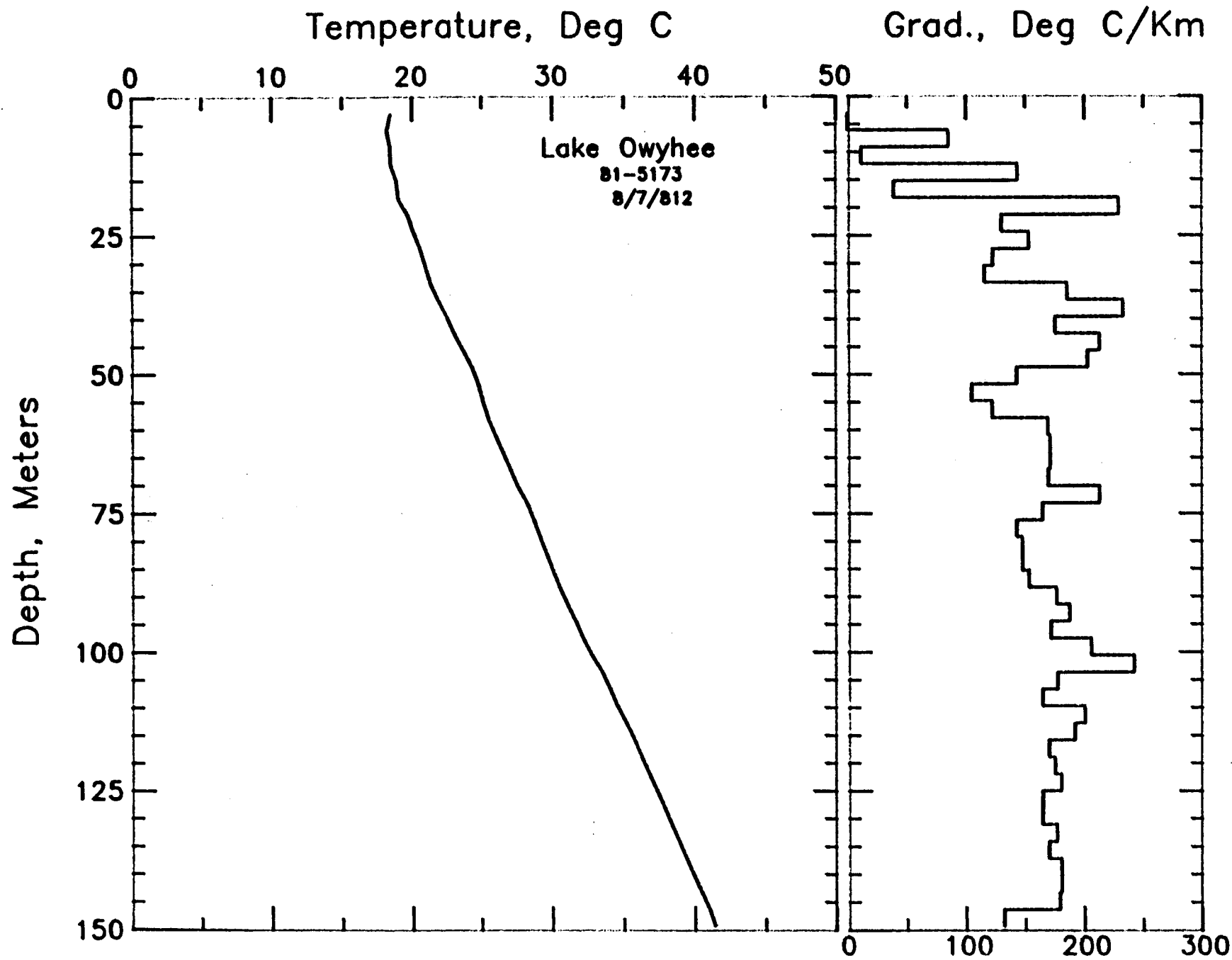
LOCATION: BOISE AMS, OREGON  
T/R-S: 1S/45E-34BAD  
HOLE NAME: 81-5173  
DATE MEASURED: 8/7/812

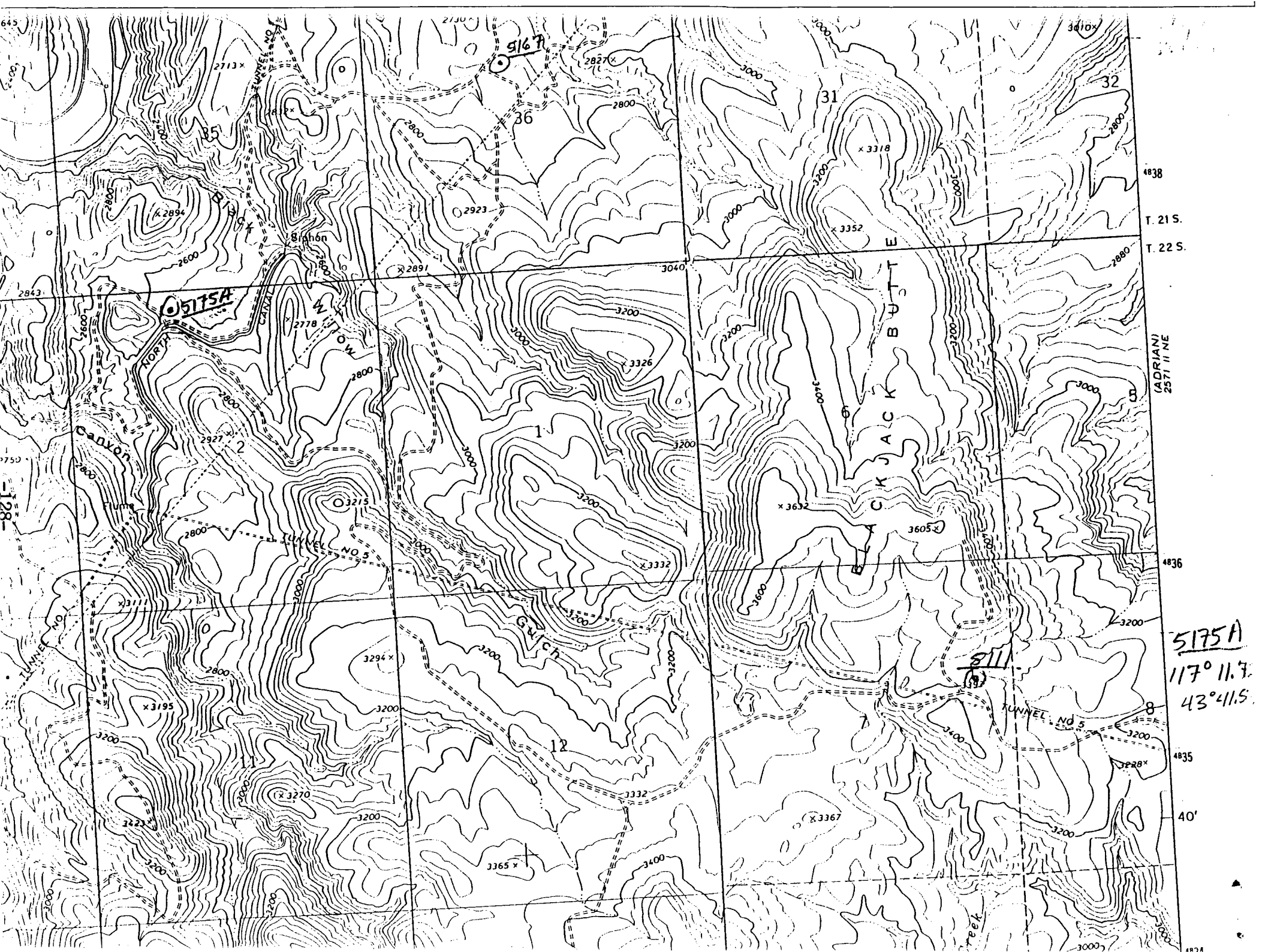
PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	37.822	164.0
131.1	38.322	164.0
134.1	38.861	176.8
137.2	39.378	169.5
140.2	39.928	180.4
143.3	40.478	180.4
146.3	41.022	178.6
149.4	41.422	131.2

TEMPERATURE, DEG C







LOCATION: BOISE AMS, OREGON  
T/R-S: 2S/45E-2BAB  
HOLE NAME: 81-5175A  
DATE MEASURED: 8/3/812

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
3.0	18.972	0.0
6.1	18.428	-178.6
9.1	18.111	-103.9
12.2	18.411	98.4
15.2	18.950	176.8
18.3	19.372	138.5
21.3	19.778	133.1
24.4	20.089	102.1
27.4	20.589	164.0
30.5	21.150	184.1
33.5	21.628	156.8
36.6	21.889	85.7
39.6	22.128	78.4
42.7	22.500	122.1
45.7	22.778	91.1
48.8	23.089	102.1
51.8	23.322	76.6
54.9	23.528	67.4
57.9	23.611	27.3
61.0	23.689	25.5
64.0	23.778	29.2
67.1	23.872	31.0
70.1	23.650	-72.9
73.2	23.650	0.0
76.2	23.539	-36.5
79.2	23.472	-21.9
82.3	23.189	-93.0
85.3	22.950	-78.4
88.4	22.978	9.1
91.4	22.989	3.6
94.5	23.072	27.3
97.5	23.478	133.1
100.6	23.728	82.0
103.6	24.089	118.5
106.7	24.761	220.5
109.7	25.400	209.6
112.8	25.628	74.7
115.8	25.889	85.7
118.9	26.500	200.5
121.9	27.100	196.9
125.0	27.700	196.9

LOCATION: BOISE AMS, OREGON  
T/R-S: 2S/45E-2BAB  
HOLE NAME: 81-5175A  
DATE MEASURED: 8/3/812

PAGE 2

DEPTH METERS	TEMPERATURE DEG C	GRADIENT DEG C/KM
128.0	28.072	122.1
131.1	28.350	91.1
134.1	28.889	176.8
137.2	29.289	131.2
140.2	29.639	114.8
143.3	30.100	151.3
146.3	30.578	156.8
149.4	30.989	134.9
152.4	31.189	65.6

TEMPERATURE, DEG C

